THE IRON AGE

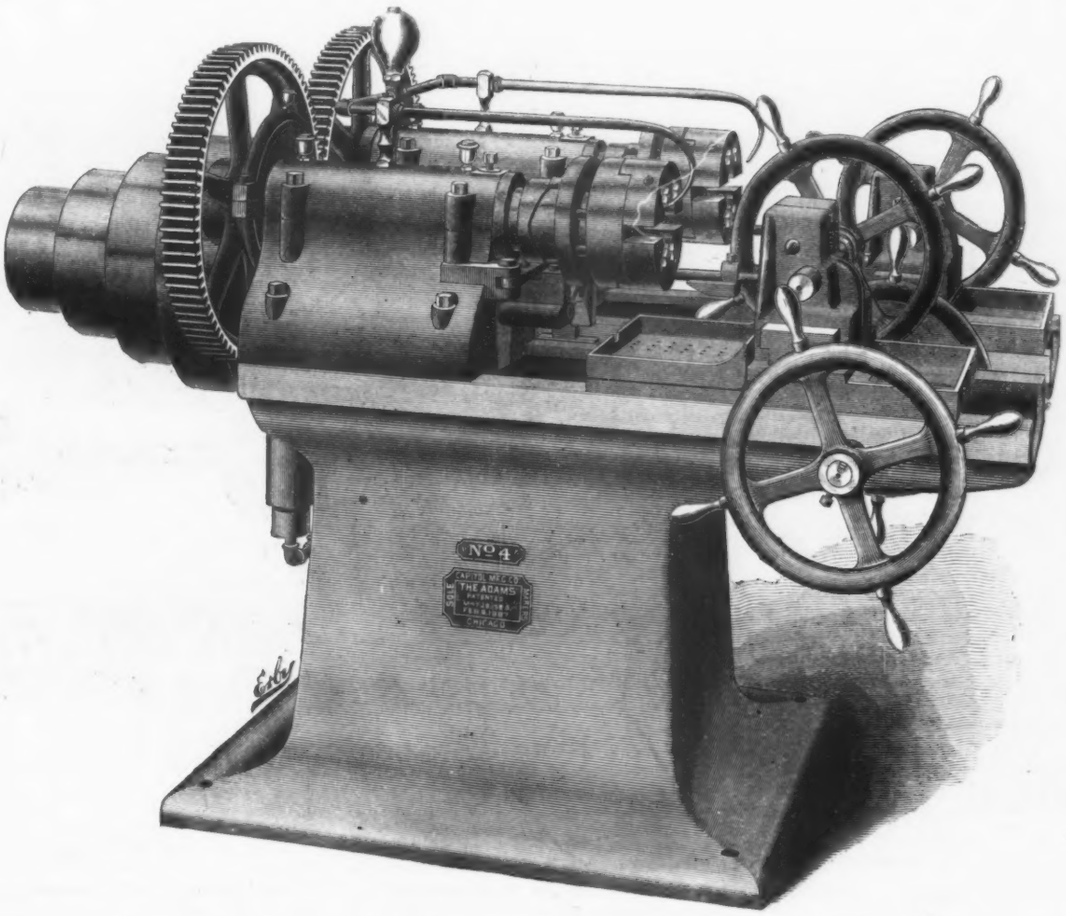
THURSDAY, NOVEMBER 21, 1889.

New Method of Securing Flues.

It is the usual practice in order to secure a flue in a boiler to expand the end of the flue into a flange through which rivets are passed to secure it to the plate of the boiler. It is obvious, however, that in thus forming a flange on the end of the flue the metal will be reduced in thickness, and this flanging can be practically done only for purposes where a small or narrow flange will suffice. It is, however, desirable in many cases where flues or tubes and pipes are used to employ forms thereof having flanges much wider in lateral extent than would be possible to forge or expand from the body of the tube without reducing the stock to such an extent that the flange would not have the requisite strength compared with the body of the tube. Thus with boiler or furnace pipes it is desirable to form integral with the body of the flue the head or plate that is to form a part of or is to connect it to the fire-chamber or boiler-shell. In an invention recently patented by W. E. Hill, of Brooklyn, N. Y., the plate forming the head is formed with a circular flange, which is welded to the flue with which it forms an integral part. In carrying out this method the central portion of the head-plate is first cut out so as to form an opening somewhat smaller than the flue. The edge of the opening is thus bent up by passing a forging at right angles to the body of the plate. If necessary two flanged openings can be formed in the plate. The head thus prepared is then welded to the flue. It is claimed that the flanged or headed flue thus produced is a much stronger structure than the flue heretofore produced and has the same lateral extent of flange or head, and it obviates all the objections incident to structures of similar shape, but having their parts riveted together.

Bolt-Threading and Nut-Tapping Machine.

We here illustrate the double No. 4 or 1½-inch Adams automatic bolt-threading and nut-tapping machine built by the Capitol Mfg. Company, of Chicago. The threading-head and automatic device for opening and closing it are the same as used on smaller sizes of machine, except being larger in dimensions. The automatic device is positive in its operation, and opens or closes the head for the purpose of releasing the bolt after it has been threaded, thus doing away with all danger of stripping the bolts. It consists in a cam groove on the head, in which is a spring-seated actuating pin provided with returning cams, the action being positive and powerful. The operating action is controlled by an adjustable collar fixed on a rod attached to the sliding carriage, and operated thereby to release the actuating pin during the feed of the carriage; and the closing of the head is accomplished by a rear adjustable collar on the same rod operating a closing lever as the carriage is returned to position. The head is made entirely of steel and consists of four parts as shown in the enlarged view. The dies are removable and easily adjusted, and are clamped rigidly by means of face screws, which can be countersunk if desired to permit the threading of a bolt close to its head. The dies are independently adjustable either way. They can be made and cut in a dummy-head attached to an ordinary lathe. It is claimed that as the dies are rigid and stationary when adjusted neither they nor the movable working parts of the machine are interfered with or worn by the action of the chips, which are not drawn in and around them, as in the open-die machine. Accurate adjustment of the die is made easy by means of a circle cut in the dies, when they are hobbed or rehobbed in the dummy-head to correspond. The carriage is gibbed to take up wear and the vise-jaws are placed in the center of it in order to secure stability and accuracy. The machine is provided with an automatic force-pump operated by an eccentric and which throws a steady stream into the head, thereby lubricating both the head and dies. The base of the machine serves as a reservoir into which the oil drains after having been strained to free it from chips. The cone-pulley has four steps—smallest 8 inches, largest 16 inches—and is intended for a 4-inch belt. The large gears are 18 inches in diameter, the pinion 3¾ inches in diameter and the face 2½ inches. All the gears are cut from the solid. The nut-



ADAMS DOUBLE AUTOMATIC BOLT-THREADING AND NUT-TAPPING MACHINE.

tap or non-clamping attachment is arranged to admit of from two to four nuts on the cutting edge of the tap at one time, thus increasing the production proportionately. This feature is desirable only when the machine is used largely for nut as well as for bolt threading. These machines are made in sizes to cut bolts from ¼ up to 5 inches, and all those made to cut bolts larger than 3 inches have a geared vise.

Wages of Iron-Molders.

A practical foundry man who was with the workingmen's excursion to Europe writes in the New York *Commercial Advertiser*: "During the 33 days we were in Europe we visited 18 cities, and in the limited time allowed the writer took every opportunity to inquire into that branch of the foundry business in which he takes a special and personal interest—that is, the condition, hours of labor, wages, &c., of the machinery molders. Of the six countries we visited—namely, England, France, Belgium, Germany, Holland and Scotland—the British molders are the best paid. For instance, let us consider the wages paid to and the number of hours worked by the iron-molders in the two principal cities in Europe—London and Paris—as shown me by the Friendly Society of Iron Founders of England, Ireland and Wales. The Friendly Society of Iron Founders of England, Ireland and Wales are one of the oldest trade societies in the world. Organized in 1809, they are now in their 80th year, and under the management of William Henry Hey they are to-day in a better condition than ever before. The total number of members belonging to the society on January 1, 1889, was 12,202, and the total amount of cash on hand at that date was $100,000. The approximate weekly wages received by the 12,202 molders mentioned above when at work is $8.20, the best receiving $10. This will give a good idea of the wages paid there; still, there is nothing definite about these figures to an American mechanic without having a knowledge of what can be obtained there in the way of living for this amount. There has been so much said about how cheap everything is in Europe, and that $8 there would buy as much as $15 here, that I concluded to spend some time in looking into this question. I visited the families of the workingmen in their homes, questioned them concerning household expenses, stopped in stores—cooperative stores at that—and obtained prices for the necessaries of life, and I must say I failed to find the low prices in anything except rent and labor."

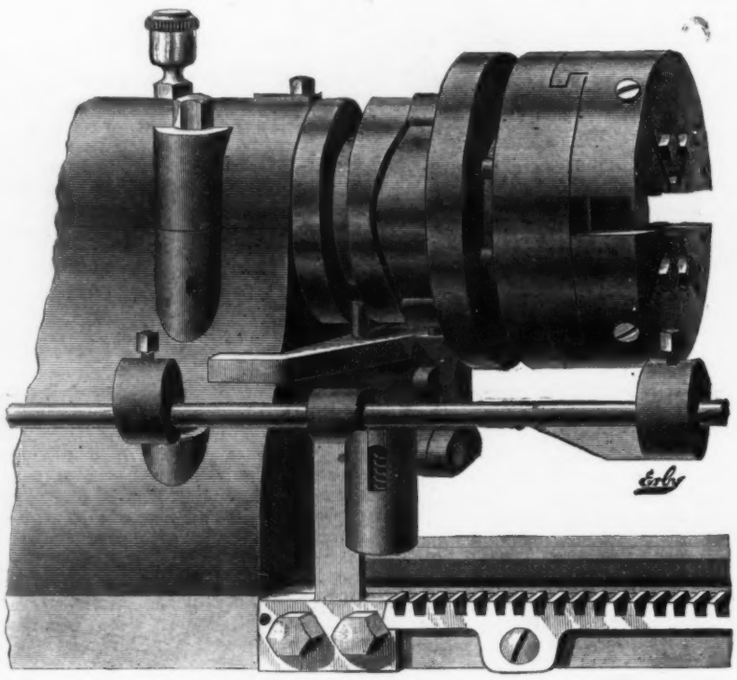
Chicago's Proposed Water-Way.—The recent city election in Chicago was an important one for possibly more than merely local considerations. It was decided by a practically unanimous vote that a sanitary district should be organized to cut a wide and deep channel from Lake Michigan to the Illinois River to dispose of the city's sewage. The citizens had been authorized to vote on the question at this time by an act of the State Legislature. The first step having been approved by the people, another election will be held in due time to choose trustees, after which the great work of construction will begin. This of course means a ship-canal which will connect the great lakes with the Mississippi River. The national Government will very naturally be expected to assist in the construction of this important trade artery, but the people of Chicago, believing that "Jove helps him who helps himself," have manifested their pluck and determination by taking upon themselves a large part of the great cost of this new water-way.

Cranes in Railway Shops.*

Erecting-shops equipped with traversers at low level need, in addition some means of lifting an engine off its wheels, and a hoist is usually fixed in the roof timbers either close to entrance or in center of length of shop over the traverser bed. Lifting-power is variously communicated to hoists by belt from shop shafting, by hydraulic pipe, by pneumatic pipe and even by hand labor. The European practice of making the erecting-shop narrow compared with its length, using three (or at the most four) longitudinal tracks and spanning them for their whole length with overhead-power traveling-cranes, has not often been adopted in America, although we have specimens at the Canadian Pacific Railway, Montreal, Altoona, West Burlington, Indianapolis, Roanoke, and at Hamilton, Ont.

Why so effective a method has been comparatively neglected it is not easy to say, as by its use there is an economy in floor space and the cranes can do duty for both transverser and hoist. Undoubtedly the roof, or a portion of it, must be carried up higher, so as to give head-room for the cranes and their load to pass over engines being repaired; but the interest on this outlay and on that of the cranes (often exceeding the cost of both traveler and hoist) is but a fraction of the money and time saved in the daily working of the shop. Two fish-bellied plate girders, extending from side wall to side wall, with their ends supported on plate box trolleys, usually form the crane-bed and carry one—or better still, two—traveling-crabs. An independent boiler on the crane, as a source of power, is now rarely used; but from the shop shafting motion is communicated to the crane by quick-moving ropes of steel wire, hemp, cotton or rawhide. If the distance the crane has to travel is short, say under 150 feet, or if it is used in the foundry where heat and dust would materially shorten the life of a fiber rope, then longitudinal shafting (grooved or square), supported on tumbling bracket journals, is often used. In almost all cases where the winch forms part of the trolley, the transfer of motion to it from the end of the crane is by such a shaft, although in the original cranes of this class designed by Mr. Ramsbottom the high-speeded cord was carried along the crane girder through the trolley to opposite end and then back to side wall, bending the cord often and shortening its life.

Messrs. Fowler, of Leeds, use steel wire rope similar to that used in steam plowing, their 12-ton crane being equipped with a ⅜-inch diameter rope moving at 270 feet per minute. One of 40 tons capacity and 50-foot span has the rope speeded to 400 feet per minute, giving a slow lift of 2 feet and a fast one of 4 feet per minute, with a cross traverse of 28 feet and a longitudinal motion of crane and load of 30 feet per minute. A 20-ton crane, using manila rope of full ¾ inch diameter, running at a speed of 2540 feet per minute, has a slow lift of 3 feet and a quick one of 51 feet per minute, with a cross traverse of trolley-carriage of 16.8 feet and a motion of the whole crane of 47.5 feet per minute. It has the hoisting-winch at one end, thus permitting the use of a 45-foot span single-box girder partially open below, the trolley-carriage traveling inside the box on the angle-irons forming the lower web.



ENLARGED VIEW OF HEAD.

The seven original Ramsbottom cranes at Crewe used long-fiber cotton rope ⅝ inch diameter, weighing 1¼ ounces to the foot, having a tension of from 17 to 18 pounds and a speed of 5000 feet per minute. Larger diameters, lower speeds and cheaper material are now used, as at Swinden, where 4½-inch rope at 970 feet per minute is employed. Messrs. Penn have used rawhide rope moving at 1,500 feet per minute; and a 50-ton crane employed on dock work has had five years' service, without showing any wear on rawhide rope of 1½-inch diameter.

At Aurora and Altoona cotton rope with speeds of 5000 feet per minute is used, giving, with the 25-ton cranes of the latter, a slow lift of 15 feet and a quick lift of 81 feet per minute, a crab traverse of 30 feet and a crane travel of 50 feet per minute. The two cranes at Alton have

* From a paper on "The Design and Construction of Railway Shops," read by J. Davis Barnett before the Canadian Society of Civil Engineers.

each two crabs, so that the engine is suspended and independently moved at the four corners, a decided convenience when dropping frame and boiler on the wheel. Where possible, it is an advantage to put the crane attendant's platform below the main girder and close to the wall, so that the work below, and not the crane machinery, is in his view.

Pneumatic floor-cranes for light weights, although not common, are used at Wilmington on the Philadelphia, Wilmington and Baltimore Railroad and at the Paige Works, Cleveland. The Missouri Pacific Railroad use compressed air at from 60 to 80 pounds pressure, to work small three-cylinder Brotherhood engines for giving motion to boring, valve-facing and other portable machines, the air being compressed by a Westinghouse brake pump and distributed through small pipes. In the engine-house, or in the shop after ordinary working hours, such portable motors can be coupled by rubber hose either to the air-pump or the boiler of the nearest locomotive in steam. The pneumatic transmission of energy is not in itself economical; but for the small powers mentioned it is far cheaper than shafting and more rapid than using manual labor.

At Seraing all classes of shop cranes are pneumatic. The reason for this practice is that with the large area under continuous roof the volume of pure cool air exhausted is of value in assisting ventilation and increasing the general health of the workmen. Our shops, sheds and freight-houses are rarely designed with the object of reducing manual labor in lifting, and many of us feel the regret expressed by Mr. Don J. Whitmore, ex-president American Society of Civil Engineers: "I could not prevail on our people to make use of the cranes to the same extent that they are used in England, and in this we are at fault." As an after-thought, pillar and other fixed cranes are occasionally applied, but their value and efficiency is limited, and for equal outlays, by far the most economical results follow the use of movable cranes. Hoisting by unskilled labor is one of the most expensive parts of the old-fashioned plant which American shops yet retain. Recent experience in the use of hydraulic drop-pits for removing single pairs of wheels (although with all its advantages an inelastic convenience) provokes such strong commendations and approval as a labor and time saving machine that it is probable that the period is not far off when overhead power lifts will be common in our shop equipment. The wear on the metal-work of cranes is not rapid, and an allowance of 5 per cent. per annum on first cost covers all depreciation, except in the matter of lifting-chains, which require care and frequent testing. Wire rope has replaced lifting-chains with economical results, its only defect being an increased diameter in pulleys and drums, the increase (about 25 per cent.) not being excessive, as the speeds are slow.

To support an overhead traveling-crane track, the plan usually adopted is to increase the thickness of the brick side-wall pilasters and arch over the window and door openings flush with pilasters up the elevated track level, thus securing a solid, safe support for crane travel, with the disadvantage of materially reducing the width inside shop and the window openings. Rolled iron, bolted to the walls both for pillars and girders, would to-day be the better practice. A good arrangement is to use stout cast-iron pillars to support both the crane-track and the roof principals, filling in between them with walls of just sufficient thickness to keep out the weather. It is difficult to use a single section of wrought-iron for this double purpose, as the support for the track must be bolted on its side and the weight from the crane is not then brought directly over the foundation, resulting in a tendency to throw the heel of the pillar outward and put the roof principal into compression. By using cast-iron pillars and varying their shape at the upper end there is no difficulty in bringing the crane weights vertically on the underground foundations. The author is not familiar with any example of a cast-iron pillar doing such double duty in any northern climate.

Six New Ocean Racers.

The twin-screw steamship industry is booming. Not less than six more powerful craft will strive between next spring and the two years following to wrest the laurels from the champion ocean-crosser of the Inman Line, the City of Paris. The Hamburg American Line, whose double-propeller, the Columbia, made a new record of 6 days 18 hours and 10 minutes to Southampton on Thursday last, will have a magnificent new twin-screw ship running in May next. She is to be called the Normania, and is now building at the yard of John Elder & Co., the constructors of the Etruria and Umbria. The Normania is a little smaller than the City of Paris, being 520 feet long, with 59 feet beam and 38 feet depth of hold. She will have 16,000 indicated horse-power. She will be launched in March next. The keel of her sister ship is being laid by the Vulcan Ship-Building Company, in Stettin. She will not be ready to run until the spring of 1892. She will be called the Venetia. The French line also has a big twin-screw ship on the stocks. She will probably be running next summer. She is called La Touraine, and is to be several thousand tons larger than any of the fine single-screw ships of the French line, which hold the record between this port and Havre. The White Star steamship Majestic, a sister ship to the Teutonic, will be ready to do battle with the City of Paris next spring. The Cunard Line will also put two twin-screw boats in the field to win back the lost laurels of the Etruria. Their names have not been selected. They will doubtless be powerful ships. They will take the place of the Servia and the Aurania, which will do duty between Liverpool and Boston.

A New National Currency.

How to provide a solid basis of security for the national bank circulation when the existing issues of bonds have been called in is a problem that engages the attention of financiers. The editor of the *Journal of Commerce*, no mean authority on such matters, speaks of the best arrangement that could be devised. He says:

The bank question would be easily settled if it was not for the silver craze. If this was once out of the way every one would see that the issue of bank notes on the security of a paid-up capital, with a joint guarantee of all the banks that entered into the arrangement, would be the most convenient and useful currency that could be devised. This may be illustrated by supposing that the 48 national banks of this city entered into such an arrangement. The institutions would first be accepted by the Comptroller of the Currency at Washington and authorized to do business, as is done under the present system. Then let each institution desiring it be furnished as now with its registered notes, but instead of this being limited to a deposit of bonds, let it be say up to 50 per cent. of the paid-in capital of the bank, upon the whole of which it should stand as the first lien. Then establish an office of redemption, where each bank should be required to redeem its issues at par in legal-tender coin.

The banks should have the right to call for a thorough examination of any one of the number, and no one should be permitted to issue notes whose capital was impaired, or which could not show a clean record. Make a provision that each bank issuing notes shall receive at par the notes of every other bank, and shall be responsible pro rata to its own issue for any loss to the bill-holders through the failure of any one to provide the means of redemption. Who does not see that these issues, although not a legal tender, would be at par at all times throughout the country? Now extend this system to every part of the Union. Let every bank willing to come into the arrangement be duly examined as to the genuineness of its claims and then be furnished with its portion of the registered currency.

Steam-Ship Models at the Marine Exhibition.

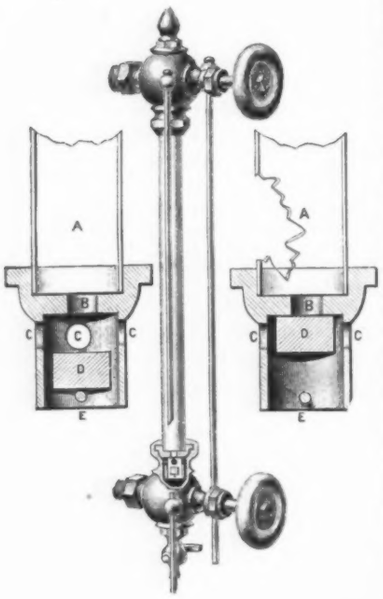
One of the most interesting subdivisions of the Maritime Exhibition at Boston is, perhaps, that which is devoted to models of the many well-known American steamships and yachts which have come from yards along the Atlantic coast. The most extensive of these exhibits is that of the Harlan & Hollingsworth Company, of Wilmington, Del. Its space is given up almost exclusively to the tiny reproductions in metal or wood of many of the well-known craft launched by this company. There were the models of all of the steam-ships of the Morgan Line. There was a notable succession of vessels, from the old Bangor of 450 tons, which was built in 1843, to the splendid specimen of what American shipwrights can do in these modern days, the Sandy Hook, which makes the trip between this city and the sand bar at the entrance of New York harbor so luxurious a one. Besides these were the models of the Vanderbilt and Webb yachts, and also the familiar outlines of Commodore Gerry's graceful Electra. There are paintings of the famous vessels which this firm have sent spinning down the ways, the most attractive of them all being the Sea Fox under full sail. Right back of this exhibit is that of the Pusey & Jonos Company, also of Wilmington. This shows plans and charts of steam-boat service adaptable to Central America and Brazil, and models of the United States Fish Commission's steamer Albatross, the German Fish Commission's steamer Fish Hawk, the famous Volunteer, the United States revenue cutter Grant, and New York's fire-boat, the Zophar Mills.

The Patent Office at Washington has decided that letters patent can be granted, indirectly, to the American Boiler-Makers' Association—that is, that letters patent on the trade-mark may be granted to an individual, who may, in turn, transfer his right to the association. This is a matter of great public importance and will materially reduce the number of boiler explosions resulting from imperfect plates, because any firm accepting the trade-mark, "A. B. M. A.," of the association must conform to their regulations with regard to the character of the plates. The members of the association have agreed to use plates only from firms carrying the trade-mark.

Among the exhibits prepared for the inspection of the delegates to the Pan-American Congress at Pittsburgh were 1 ton ingots pure aluminium (2240 pounds) and one ingot weighing 150 pounds, of one solid casting, besides metal in shapes of thin hammered foil plates and bars. Also many manufactured articles from the works of the Pittsburgh Reduction Company, Pittsburgh.

Water-Gauge Valve.

This valve is intended to be used in connection with the water-gauges of steam-boilers. It is so constructed as to close the outlet and prevent the escape of water in case the glass should get broken. The valve, which is shown broken away in the two central figures, consists of a tube having a head formed with a socket to receive the end of the glass tube A. The water enters the tube through the opening B. The valve D is a cylindrical metallic



Automatic Water-Gauge Valve.

block, fitting loosely in its case, adapted to close the opening B. Water enters the case through the openings C C. It is evident that while the pressure of water on all sides of the valve D is equal, it will be balanced and the passages will be open. But should the pressure upon the top of the valve be removed by the breaking of the tube, the valve will seat itself and close the entrance B to the tube as shown in the right-hand view. This valve is made by C. B. Dunton, of Portland, Maine.

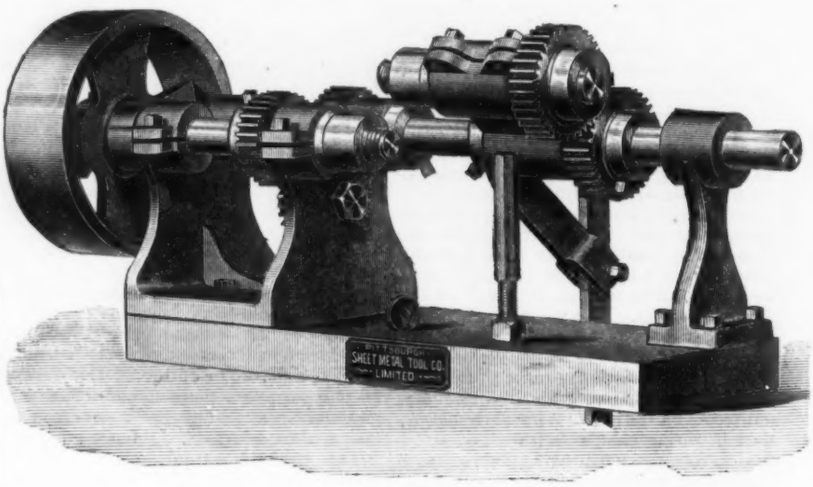
Contract Trials of New Vessels.

The official trials of the Petrel, Yorktown, Charleston and Baltimore are discussed at considerable length in the annual report of Commodore Melville, Chief of the Bureau of Steam Engineering of the navy. In the case of the Petrel, Commodore Melville believes that "the failure to get the contract power was due entirely to the inexperience of the contractors in forced-draft trials, and to their lack of appreciation of the necessity for a skilled fire-room force, as demonstrated by the fact that the average power maintained during the first two hours was over 1300, while the average for the four hours fell below 1100. Add to the inexperience of the men the fact that the coal used contained about 17 per cent. of refuse and the cause of failure is not hard to see. The materials and workmanship are first-class, everything has been constructed in accordance with the terms of the contract, and as I am fully convinced that we shall get a great deal more than the contract power out of the machinery, I recommend that the penalty for deficiency of horse-power be remitted." Of the second trial of the Charleston the report says: "The trial was unquestionably the best one made by any of our new vessels, the ship having been under full power for six hours and the indicated horse-power developed having steadily increased up to the end of the trial." The Chief Engineer believes the Government has in the Charleston a much better vessel than was contracted for, and he recommends a remission of the penalties.

Of the Baltimore the report says: "The contractors for the Baltimore, not being satisfied with the results of the first trial, and believing that they can get more power out of the machinery, have determined, with the Department's consent, to have a new trial. Although the indicated horse-power fell slightly below the requirements of the contract, I think the vessel should be accepted without penalty, even should she fail to get the contract power on the second trial; for since the award of contract a number of changes in design have been made by the contractors, all tending to improve the machinery, and, as in the case of the Charleston, the Baltimore, as she now stands, is a better ship, so far as her machinery is concerned, than the original design called for. That she did not develop the power for which she was designed is not at all surprising. No machinery of this type has yet been designed which, carrying the same boiler-pressure that the Baltimore did on trial, has done any better than she did. And it is all the more gratifying to note that the Baltimore did it on the first trial, because high-powered foreign ships seldom or never succeed the first time they are tried."

Threading and Knurling Machine.

The Pittsburgh Sheet Metal Tool Company, Limited, of Allegheny, Pa., have recently placed upon the market a new threading and knurling machine, a general view of which is shown in the accompanying illustration. This machine has been brought out to fill a well-defined requirement of the trade, and one which is calculated to satisfactorily perform all kinds of small screw-work, such as salt and pepper tops, oil-can screws, &c. The manufacturers state that the machine has a capacity for threading up to 2¼ inches diameter. It is provided with steel shafts and is so arranged as to take up all wear. All the gears are cut from solid material. The machine complete weighs 140 pounds.



THREADING AND KNURLING MACHINE.

Coleman Sellers, professor of engineering practice in Stevens Institute, has begun his second annual course of lectures on practical problems in engineering design. The lectures will be held at the institute on Mondays and Tuesdays of the next three weeks, at 3 o'clock. The first two lectures will be on the transmission of power in shops, involving questions of shafting and pulleys and the use of materials of commercial sizes in construction. The third lecture will deal with hydraulic forging, as contrasted with the common method of hammer-forging, and will be illustrated from the Whitworth shops in England in the construction of armor for ships and other heavy work.

The Burning of Furnace-Plates.—M. Hirsch has during the past few months been engaged in making experiments on the causes of the burning of the furnace-plates of boilers and finds that in many cases the introduction of oil into the boiler is decidedly dangerous. In making the experiments the inside of the boiler was painted with oil and then filled and heated in the usual way. With certain oils it was found that the plates became much hotter than when water was directly in contact with them, and this difference of temperature increased as the fire was pushed, reaching 50° C. when the rate of evaporation was 31 pounds of water per square foot per hour and 200° C. when this rate was raised to 51 pounds of water. In one instance, when the rate was not more than 35 pounds of water per square foot of grate area, the temperature of the plate was found to be higher than 450° C., the melting point of the zinc. To investigate the subject more fully, a tin flask was coated with oil in the way described above and filled with water. On heating this it was found that with certain oils the tin could be raised to a red heat even when exposed to but a moderate-sized flame. Of the different oils linseed is the worst, but colza runs it close. Naphtha does not occasion overheating unless it decomposes, which it is very liable to do if the heating is too rapid. Valvoline only occasions burning under excessive rates of evaporation. In general oils that are decomposed by heat were found to be especially dangerous, while mineral oils are comparatively safe.

W. G. Allen, consul at Kingston, advises the Department of State that an exhibition is to be held on the island of Jamaica in the winter of 1890–91 under Government auspices. Consul Allen writes that the opportunity will be a good one for the exhibition of sugar machinery such as is manufactured by machine-shops in America.

Foundry With 80-Ton Cranes.

[*With Supplementary Sheet of Engravings.*]

The rapid increase in size and weight of rolls in the past few years, with the probability that the maximum sizes will not be reached for some time to come, has made an increase in the strength of machinery for handling these immense castings imperative. The new foundry of the Phœnix Roll Works, Seaman, Sleeth & Black, of Pittsburgh, is of great interest because of the method of construction of the building itself and because it probably contains the two largest jib cranes in this country.

The building proper, of which we present roof and ground plans and side and end elevations, was designed and erected by the Pittsburgh Bridge Company, who also built the cranes. The frame-work of the building, which measures 60 x 100 feet and has a clear hight of 35 feet, is of iron, the roof covering of slate and the sides of corrugated iron. A ventilator extends its entire length. The construction adopted is that known as the riveted type. The side of the building is divided into six bays of 16 feet 8 inches each, making 7 trusses and 14 columns necessary. The trusses are six-paneled Pratt type, with riveted connections. The depth from out to out is 12 feet, and as the chords are parallel the ends of the trusses project through the roof, as shown in the end elevation, Fig. 7.

The columns are formed of four angles and web plate, making a beam section having its web in the plane of the trusses. The depth of the web at the lower chord line is 3 feet, while at the foot of each column it is narrowed to 18 inches. The columns are carried to the top chords of the trusses; this insures stiffness transversely.

Longitudinally a system of struts and tie-rods carries the stresses from the overturning tendency of the cranes to the bases of the columns. Two heavy anchor bolts in each column run down through the whole depth of masonry footings, some 4 feet, and are provided with large cast-iron washers below. The wrought-iron shoes of the columns rest on heavy castings placed on top of the masonry.

In the plane of the lower chords of the trusses is a heavy riveted lattice system (Fig. 9) of angles which distributes the stresses created by the cranes to the columns and longitudinal bracing.

The crane-frames are made up of angles and plates for the booms and masts, while the jibs are made double, each being a column composed of two channels and two plates as shown in the side elevation (Fig. 1) and the plan (Fig. 2). The lower end of the mast terminates in a hat-shaped casting (Fig. 3), the inner under side of which is rounded to rest upon a similar block supported by the foundation. Between the block and casting are cylindrical rollers which receive the side thrust of the crane. The upper bearing of the mast is also provided with rollers. This method of mounting the crane has overcome friction to such an extent that it can be swung by one man when carrying the heaviest roll.

The arrangement of the machinery for operating the crane and the disposition of the chain for hoisting and also the one for racking in and out are clearly shown in the drawings (Figs. 1, 2, 4 and 5). The gearing is driven by a steam-engine carried near the bottom of the mast and connected to drive the worm. All the several movements of the crane are controlled by levers placed within easy reach.

The boom at Pierre, the capital of South Dakota, has already subsided.

Providence Notes.

The Narragansett Machine Company have commenced the foundations for their new buildings at Woodlawn, about three miles from this city. The buildings will consist of a two-story brick building 200 x 50 feet in size for a manufactory; a one-story wooden building 200 x 30 feet in size for the storage and drying of lumber used in the manufactory, and a brick boiler-house 40 feet square and 20 feet high, with a chimney 75 feet high and about 7 feet square at the base. The foundations are well under way and the work will be carried forward as rapidly as possible. The contract provides that the buildings shall be finished by the 1st of February, 1890, but much depends on the character of the winter weather. A spur track has been laid by the New England Railroad Company to and nearly the entire length of the building, which is now used for the transportation of material for the buildings, and at their completion will be used by this company for the transportation of supplies and of manufactured goods. This company are now doing business in the old Sprague mowing-machine buildings, on Sprague street, but needing more room they decided to build. At their present location they have 12,000 feet of floor-space, but in the new building they will have 20,000. The manufactory will be supplied with the Corliss engine and boiler complete. This firm manufacture light machinery and gymnasium supplies, in which latter they do a very large business, supplying the greater portion of the gymnasiums of the country. It is more than likely that a foundry will be added to this establishment next year. When the new buildings are ready for occupancy the number of employees will be increased to 100 hands.

Another series of buildings in close proximity to the above are the new works of the Hope Webbing Company. The main building, which is for the weaving department, is 264 x 77 feet in size, one story of brick, with a monitor roof. The walls of this building are nearly completed. Then there is a basement under the end of the main building 77 x 60 feet and an L 60 x 61 feet in size, of two stories, where the offices and other departments of the manufactory will be situated. The boiler-house will be 20 x 24 feet in size and 24 feet high, and the chimney will be 7 feet 8 inches square at the base and 72 feet high and is nearly completed. The buildings will probably be all completed by the middle of December.

Recently the Shunoc water-pressure was turned on to the new and complete system of automatic fire-sprinkler in the extensive wood-working establishment of Robert A. Sherman, in Westerly. Unlike the systems often noticed in the general run of mills and factories, this work, just completed, is known as a dry system, which is necessary on account of the low temperature in winter which exists within buildings of this description. In instances of the former kind the water is let on to the whole system, held back by only the little patent devices which when heated to a given degree burst their bands of solder and then deluge the surroundings. Should that plan be utilized in such a building as Mr. Sherman's the pipes would become useless from the freezing of the water within. Hence the "dry system" of automatic sprinklers. The method adopted is quite interesting in its line and is as follows: A 4-inch pipe runs into the boiler-room from the street-main, which is kept under pressure varying from 85 to 93 pounds to the square inch. Attached to this pipe is a valve, which is an interesting and simple piece of mechanism. This valve moves upward when in use, and the under part of it is 4 inches in diameter, while the upper part is 12 inches in diameter. Above the upper part a connection is made with an air-compressor, which is operated occasionally from the shafting with a belt-rig. From the valve upward and onward through the works runs a system of piping of all sizes from 4 inches to 1¼ inches, to which at intervals are attached ordinary automatic sprinklers of an approved pattern, about 6 or 8 feet apart, the same as are used on wet systems. Before the system is ready for use the air-compressor is started and the upper part of the valve and the piping beyond it are filled with air, and a pressure of 40 pounds to the square inch is attained. Thus on the upper disk of the valve, with an area of 113 square inches, a weight of 4520 pounds is kept. Beneath the valve the area is about 12½ inches, and even with a water-pressure of 100 pounds the upward force exerted would be only 1250 pounds. In that manner the water is held back until by chance a fire occurs, when suddenly a sprinkler will let go, the air escapes from the system, the valve is freed from its downward force, and the under pressure, finding itself no longer restrained, pushes its way along and outward through the sprinkler to its duty. Mr. Sherman has also had a large hydrant placed in position near the works. CLIFFORD.

The New Works of G. A. Crosby & Co.

G. A. Crosby & Co., manufacturers of sheet-metal workers' machinery, are now occupying their new establishment at 176 and 178 South Clinton street, Chicago. The building is a three-story iron and brick structure, with a pressed-brick front, built expressly for the firm's purposes, and has been most substantially constructed throughout with heavy walls and girders of double strength, with a view to providing for additional stories, which, if the present rapid increase of business continues, will be needed at an early date. The main structure is 140 feet deep, 36 feet wide in front and 44 feet wide in the rear. A plan has been adopted in the erection of this building which is worthy of being followed by others who desire to erect a factory on a city lot and who desire to protect themselves against the darkening of the center of their building by structures erected on adjoining lots. A court is laid out in the middle of the side of the building, 52 feet long and 10 feet wide at its narrowest end. The sides of the building fronting on this court are constructed wholly of iron and glass, so as to secure a maximum of light for the benefit of the workmen who are engaged in the central part of the factory. The office occupies the front, in the rear of which is the shipping-room, and the remainder of the floor is devoted to the erecting-shop. The office is very neatly arranged and finished in yellow pine, with glass partitions separating the private offices from the general office. The office is furnished with a vault, which is built from the basement to the top story and has openings on every floor, for the storage of articles of value. The shipping-room is supplied with an elevator connecting it with each floor. The elevator is of 6000 pounds capacity, operated with worm and gear, and was built by Eaton & Prince. The erecting-shop has a tool-room along the side of the rear in which tools are stored under the control of one person, who keeps a record of the men who have taken them. It is the intention of the firm to put in an electric annunciator with a button at each machine, so that a workman can call for a tool without leaving his place. A small power elevator is to be put in, to connect each floor with the tool-room. They also intend to connect speaking-tubes from the office to each workman, so that he can be communicated with when any special information is desired. It will be seen from this plan that ample provis-

ion has been made for securing perfect light in every direction possible.

The basement is arranged on the same plan as the first floor, with the exception of an addition in the rear for a blacksmith's shop. This is 1½ stories high, 20 feet wide and 44 feet long, with a skylight on the roof 12 x 30 feet, having improved ventilators. It is supplied with a Bement, Miles & Co. direct-acting 1100-pound steam-hammer, weighing 9 tons, and the necessary blacksmith's fires. In the main building, in the immediate vicinity, are racks containing the stock of iron, steel and miscellaneous castings for the various parts of machines built by the firm. In the front of the basement the engine is located, which is of the Hamilton-Corliss make, 12 x 13 inches. A steel boiler built by the National Boiler Works, of Chicago, furnishes the steam. The large planers used by the company are located on this floor in close proximity to the engine, where there is abundance of room, light and also a very substantial foundation. Special care was taken in constructing the floor of the basement, which is composed of a good depth of concrete covered with heavy plastering, on the surface of which is a hard-wood floor. All the other floors also have hardwood surfaces. A peculiarity of the construction of the building which may be noted here is that the girders and joists, as well as the under part of the flooring, have been planed, so that no rough surfaces are presented which would easily catch fire. This style of building was prompted in order to effect a saving in the cost of insurance, which amply pays for the extra expense entailed.

The third floor of the building is used for die-work and light machinery-work. It is fitted with a large number of lathes, drills, millers, planers, &c., of the very latest pattern, arranged to work automatically as much as possible. Workmen's lavatories are arranged on each floor. The Sturtevant hot-blast system will be used for heating and ventilating the entire building.

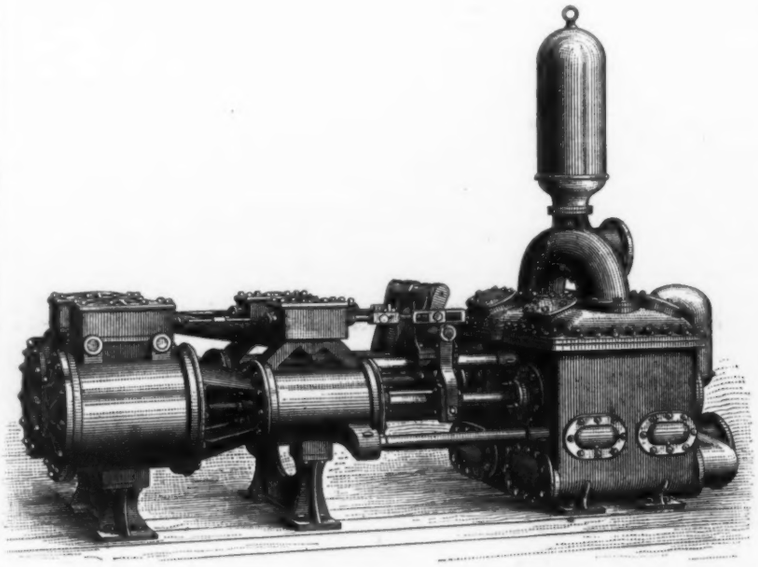
This establishment was founded by G. A. Crosby in 1867. The firm was first known as Crosby & Nesser, then G. A. Crosby, and changed some ten years since to G. A. Crosby & Co., which style has been continued until the present time. The firm have been remarkably prosperous, having never experienced a dull season since the establishment was founded. While they make a general line of sheet-metal workers' machinery, they pay special attention to fruit-canning machinery, lard-pail tools and pieced tin-ware tools. They have also built up quite a business in every section of the country in the manufacture of presses and dies for soap, such as are used by the manufacturers of all grades of pressed toilet and laundry soap. The reputation of the firm is now so widely established that their trade extends beyond the borders of this country.

Notice has been given by the limestone operators of the Mahoning Valley that commencing with the 11th inst. the wages of the day men would be increased 10 cents per day and the price of quarrying advanced from 15 cents per ton to 16⅔ cents. The increase in wages was unsolicited and was an agreeable surprise to the men. The same advance will be given in the Shenango Valley.

The iron manufacturers of Western Pennsylvania have overturned a joint agreement of the Central Traffic trunk lines and Chicago and Ohio River Traffic associations relative to an advance in rates on pig-iron. The demands of the iron men were altogether too vigorous to withstand. At the meeting of the Central Traffic Association Freight Committee and the Chicago and Ohio River Traffic Association the following resolution in effect was adopted: "*Resolved*, That the rates named in Central Traffic Association circulars Nos. 569 and 572, dates August 28, 1889, and supplements thereto, on pig-iron and articles named in said defined circulars, be restored, effective November 18, 1889."

Compound Duplex Pump.

In this pump the steam, after having been used in the high-pressure cylinders, is expanded into the low-pressure cylinders without complication of the working parts or intricate valve-gear. The steam passes from one high-pressure cylinder through passages diagonally across to the opposite low-pressure cylinder. The valves are operated by rocking-arms actuated by a collar on the piston-rod, and which can be adjusted to shift the valves as required. The lower end of each rocking-arm is forked and each end of the fork is provided with a journaled plate fitted to move in slides formed on opposite sides of the collar on the piston-rod and which the fork spans. This method of oscillating the arms reduces the number of working parts and produces a joint not liable to wear. The pump illustrated has a high-pressure cylinder 14 inches in diameter, low-pressure 24 inches, water-cylinder 12 inches and a stroke of 18 inches. This pump is built by the Hughes Steam Pump Company, of Cleveland, Ohio.



COMPOUND DUPLEX PUMP.

Test of a Smoke-Consumer.—The Tinkham Smoke-Consumer was tested in Boston last week in the presence of a number of business men interested. The invention consists of a pipe leading from the steam-dome through the smoke-stack to a nozzle which projects into the furnace just above the doors. This nozzle is so constructed that as the steam passes through it it becomes superheated and issues through small ports into the fire-box in the form of hydrogen, which immediately combines with oxygen furnished by means of an air-tube. Being injected directly over the burning fuel, this hydrogen mingles with the carbon arising and complete combustion takes place. The test, or rather exhibition, was eminently satisfactory. Within one minute after the furnace-door was closed no smoke could be observed issuing from the chimney. The invention was affixed to the boilers of a neighboring hat factory, and in 60 seconds after the fires were stirred up and fresh fuel added the thick smoke ceased to issue from the chimney top.

Liability of Employers for Accidents.

The case of Ellen I. Ballard, administratrix, against the Hitchcock Mfg. Company, which has recently engrossed the attention of the Cortland County, N. Y., Supreme Court, is one of peculiar interest to manufacturers and their employees. The defendant company are a large wagon-making concern at Cortland. The plaintiff is the widow of William P. Ballard, who was one of the workmen killed in the defendants' shops by the explosion of a steam-boiler on May 30, 1887. The action was brought by the widow to recover $10,000 damages for the loss of her husband. The vital point at issue in the case relates to the liability of employers to their workmen on account of accidents caused by defective and unsafe machinery, where, as is alleged, the precautions required by common prudence and by the law have been complied with by the employer. The case was first tried at the January Circuit, 1888, when the jury gave the plaintiff a verdict for $4000 damages and costs. The defendants took an appeal to the General Term, which tribunal, after a rehearing of arguments, handed down a decision to the effect that the defendant company were not required to make extraordinary and unreasonable tests of their machinery for discovering hidden defects, and that in the case in hand the verdict was not warranted by the evidence. The judgment, therefore, was set aside and a new trial ordered. At the new trial just had before Justice G. A. Forbes and a jury the testimony on both sides was substantially as before, and the jury this time gave the plaintiff a verdict for $2050 and costs. The counsel for the defendants immediately gave notice of an appeal on the same grounds as before.

The new steamer Plymouth now being built for the Fall River Line by the Fletcher Iron Works will have four-cylinder engines, designed by Stevenson Taylor. Of the four cylinders—high, intermediate and two low-pressure—the two low-pressure ones will be placed on one side of the shaft, while the others will be on the opposite side. The two cranks will be at right angles.

The Late John Crerar's Will.

The property of the late John Crerar, of Chicago, has been appraised at a total valuation of $3,500,000, of which only $50,000 is in real estate. Being a bachelor and without immediate relatives, his will makes large bequests of a public and religious character, while his distant kinsmen and friends are handsomely remembered. A bequest of $50,000 is made to J. McGregor Adams, his partner in the firm of Crerar, Adams & Co., railway-supply and heavy-hardware merchants, and also an associate in the Adams & Westlake Company, of Chicago Another partner in the firm of Crerar, Adams & Co., Edward S. Shepherd, receives $50,000. To Morris K. Jesup and John S. Kennedy, of New York, with whom the deceased was at one time associated in business, the sum of $1000 each is given for the purchase of an appropriate testimonial. Large sums ranging from $100,000 to $10,000 are given to Presbyterian churches in Chicago and New York and to public institutions of a charitable or educational character in Chicago. A bequest of $100,000 is made for a colossal statue of Abraham Lincoln. The residue of the estate is to be used in establishing a free public library in Chicago to be called "The John Crerar Library." It is expected that at least $1,500,000 will be available for this purpose. If the surviving members of the firm of Crerar, Adams & Co. elect, they are to have the use of Mr. Crerar's money in that firm at 6 per cent. interest for two years, to give them time enough to turn around without liquidating at once. J. McGregor Adams and Edward S. Shepherd are to have a preference in purchasing his interest in the Adams & Westlake Company if the executors and trustees deem it best to sell. A. J. Leith, president of the Illinois Steel Company, is also given preference of purchase in case of the sale of Mr. Crerar's stock in the Joliet Steel Company, who have been merged into the Illinois Steel Company since the will was drawn up.

This will is regarded as the most important from a public stand-point that has been probated in Chicago for several years As is well said by a local paper, Mr. Crerar has done more for the cause of charity and for mankind than any Chicagoan who has yet been gathered to his fathers. It is true that he was unmarried and had neither brothers nor sisters living, so that there were none close to him by ties of common blood to lessen his benefactions. But one great merit of his will —every word of which was written by himself and is marked by his peculiarities of thought and expression—is the breadth of his giving and the number of persons and institutions he has remembered. Mr. Crerar has proved himself not unworthy to be the possessor of the great wealth he had amassed during his useful life. His bones will rest in Greenwood Cemetery, Brooklyn, marked by "a plain headstone similar to that which marks my mother's grave." His memory will be kept alive by the schools and charities he has aided and the great seminary of learning he has founded. The name of John Crerar will be remembered and honored long after all those now alive in Chicago shall be dust and ashes.

The report of the Ordnance Bureau of the Navy Department upon the cast-steel gun made at Thurlow, near Chester, Pa., and tested at the Annapolis proving grounds, has been laid before the Secretary of the Navy. The report of the Ordnance Bureau merely gives the facts in the case as determined by measurements of the star gauge. The measurements of the gauge as reported indicate that the gun shows an expansion after its tests which, although it did not burst like the Pittsburgh cast-steel gun, proves that it is not fit for service. It has always been assumed that this gun would be accepted by the Department for further tests, although not for use on shipboard, but the facts related in the bureau report are such as to make the assumption more than doubtful.

Southern Freights on Manufactured Iron.

The Southern Railway and Steamship Association have just issued their second Joint Manufactured Iron Tariff, which embraces the articles enumerated in the first tariff, printed in *The Iron Age* November 7, page 725.

Where to.	From Birmingham, Ala.		From Chattanooga, Tenn.	
	L. C. L.	C. L. Not less than 30,000 pounds.	L. C. L.	C. L. Not less than 30,000 pounds.
Akron, Ohio	32	26	29	24
Allegheny, Pa.	34	28	31	26
*Atchison, Kan.	43	34	43	34
Atlanta, Ill.	34	28	31	26
Aurora, Ill	34	28	31	26
Aurora, Ind.	22	17	19	15
Bellaire, Ohio	33	27	30	25
Belleville, Ill.	20	15	18	14
Belmont, Mo.	17	13	16	12
Bloomington, Ill.	33	27	30	25
Bridgeport, Ohio.	33	27	30	25
Cairo, Ill.	17	13	16	12
Chicago, Ill.	32	25	29	23
Cincinnati, Ohio.	17	13	14	11
Cleveland, Ohio.	32	26	29	24
Columbus, Ky.	16	12	14	11
Columbus, Ohio.	30	22	27	20
Danville, Ill.	32	26	29	24
Dayton, Ohio.	26	20⅓	23	18⅓
Detroit, Mich.	33	27	30	25
East Cairo, Ky.	16	12	14	11
East Saginaw, Mich.	35	29	32	27
East St. Louis, Ill.	20	15	18	14
Evansville, Ind.	17	13	16	12
Fort Wayne, Ind.	31	24	28	22
Greencastle, Ind.	30	22	28	21
Grand Crossing, Ill.	32	25	29	23
Hamilton, Ohio.	24	18½	21	16⅓
Hegewisch, Ill.	32	25	29	23
Hillsboro, Ohio.	27	20⅓	24	18⅓
Indianapolis, Ind	26	21	23	19
Jacksonville, Ill.	34	28	33	27
Jeffersonville, Ind.	19	15	17	14
*Kansas City, Mo.	43	34	43	34
Lafayette, Ind.	31	24	28	22
Lawrenceburg, Ind.	42	17	19	15
*Leavenworth, Kan.	43	34	43	34
Lima, Ohio	30	23	27	21
Louisville, Ky.	16	12	14	11
Mansfield, Ohio.	31	24	28	22
Mattoon, Ill.	31	24	30	23
Memphis, Tenn.	13	10	13	10
Mendota, Ill.	34	28	31	26
Miamisburg, Ohio.	26	20⅓	22	18⅓
Michigan City, Ind.	34	28	31	26
New Albany, Ind.	19	15	17	14
Newark, Ohio.	30	22	27	20
Newport, Ky.	17	13	14	11
Peoria, Ill.	34	28	31	26
Pittsburgh, Pa.	34	28	31	26
Sandusky, Ohio.	31	23	29	22
South Bend, Ind.	34	28	31	26
Springfield, Ill.	34	28	33	27
Springfield, Ohio	28	21⅓	25	19⅓
Steubenville, Ohio.	33	27	30	25
*St. Joseph, Mo.	43	34	43	34
St. Louis, Mo.	20	15	18	14
Terre Haute, Ind	30	22	28	21
Toledo, Ohio.	32	25	29	23
Wheeling, W. Va.	33	27	30	25
Wyandotte, Mich.	33	27	30	25
Zanesville, Ohio.	31	24	28	22

*To points marked thus * rate will be 37 cents per 100 pounds on shipments of 20,000 pounds and over and less than 30,000 pounds.

Our New Navy.

Congress has authorized the construction of eight vessels which have not yet been contracted for. First in importance of these is the heaviest of the armor-clads—7500 tons; then the largest of the unarmored cruisers—5300 tons; then the partly submerging monitor of about 3000 tons; then the harbor-defense ram; the second dynamite cruiser, which will not in all probability be undertaken until after the Vesuvius has demonstrated her ability to destroy an object the size of a ship at a distance of a mile and a half; and lastly, three small unarmored gun-boats. Of these the three last-mentioned are ready for the contractors. Two of these have a displacement of 1000 tons, a length of 190 feet, beam 32 feet and a mean draft of 12 feet. Their engines are intended to give a maximum of 1600 horse-power under forced draft, which is expected to give a speed of 14 knots. The last of these three is 800 tons, 180 feet long, 32 feet beam and has a draft of 11½ feet. A horse-power of 1300 is expected to give a speed of 13 knots. The main battery in each case will consist entirely of 4-inch rapid-fire rifled breech-loaders. Of these the practice-ship will have four and the other two vessels eight each. Each vessel in addition will have a suitable secondary battery of smaller rapid-fire guns, revolving-cannon and Gatlings. The main battery of the two 1000 ton gun-boats is almost an ideal one, since while it avoids the difficulty feared in the case of the Petrel, namely, of carrying guns of too heavy a caliber, it will vastly increase the weight of metal that can be thrown from a broadside in a given time. The Petrel's battery consists of four 6-inch breech-loading rifles, but they are not rapid-fire; accordingly, the eight 4-inch rapid-fire guns carried on each of the new vessels will be more effective, while avoiding the doubt created by some recent English experience as to whether modern vessels of this size are not commonly provided with guns too heavy for them.

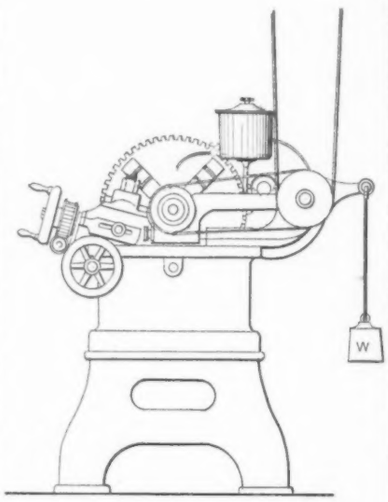
With the 3000-ton, the 2000-ton and the vessels now planned we shall have no fewer than eight new war-ships armed exclusively in their main batteries with rapid-firing guns. The performances of such guns in England and elsewhere, notably in the batteries of the famous Italian cruiser Piedmonte, puts their efficiency beyond question. Presumably, therefore, early attention will be given to producing an ample supply of this ordnance for the eight vessels now designed or under construction.

Rolls for Fluid-Steel Rolling.—Seaman, Sleeth & Black, of Pittsburgh, are at work on the rolls to be used in the new fluid-steel rolling plant which is being erected at Maywood, near Chicago, by the Norton Fluid Metal Rolling Company. The rolls are cast hollow, with a diaphragm in the center, supported at several points to keep it in place. The object of the diaphragm is to properly direct a stream of water entering the rolls to keep them cool. A 4-inch pipe conveys the water into the rolls, and a Worthington high-pressure pump will be employed to insure its rapid passage. The face of the rolls will be 14 inches wide, as that width is deemed the most suitable for the manufacture of sheet steel specially designed for tin-plate. The same firm are also turning out hollow rolls for the company, which will form part of the outfit of several works to be erected in different sections of the country for the manufacture of steel solder by the Norton process.

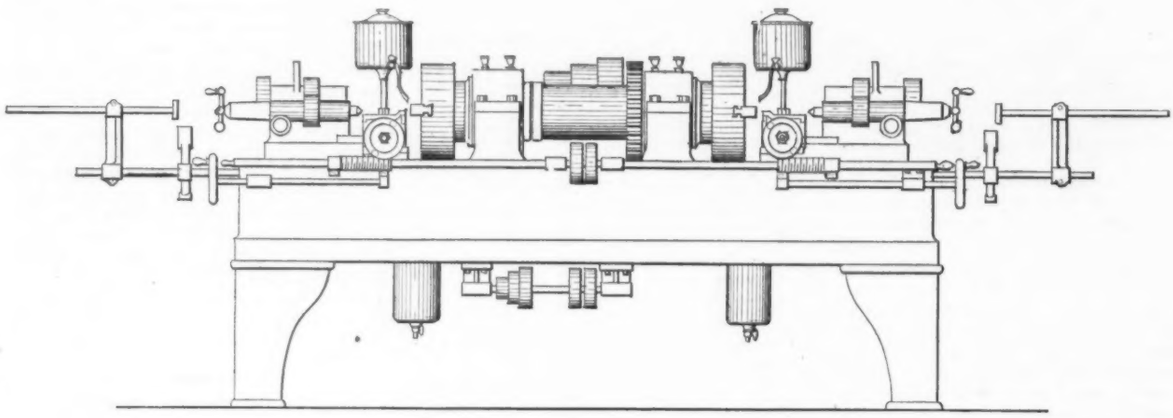
Two street railways in Rochester have been purchased by New York and Pittsburgh capitalists for $2,000,000.

Double Cutting-Off and Center-Drilling Machine.

This machine was designed to save the labor of handling large quantities of shafting, rod and similar work. Within certain lengths both ends can be cut, dressed and centered at the same time. For longer lengths one end is first finished, when the bar is drawn through for the other. A lengthwise feed of the tool-post and slide enables an end to be turned up for dogging when of any advantage. The machine consists of a strong, heavy bed, in the center of which is placed the main spindle, which is made hollow to receive the work. This spindle runs in large bearing and is driven by gearing connecting with the cone-shaft placed at the back of the machine. At either end of the spindle is a chuck for grasping the work. Beyond these are located the tool-posts, which are provided with an automatic cross-feed used in severing or squaring up the work and also with a sidewise motion or hand-feed. This permits the working point to be reached rapidly and does away with the labor of pulling and pushing large bars. Located further toward the ends and back are the center-drilling attachments, which carry a drill countersink and have a hand-feed. When not in use the drill-shaft and frame are thrown back, leaving a clear space for handling the shafting. To do this easily the frame is pivoted on the back of the bed and balanced. A pull-pin locks the drill-shaft in a central position for use, while its own weight keeps it in a vertical position when thrown back. Although designed for a special purpose, the machine can be used simply for cutting off. A follower is provided to centralize and push through short lengths and outer supports and cutting-off gauges for long lengths and duplicate pieces. This machine is made by Nicholson & Waterman, of Providence, R. I.



End Elevation.



Side Elevation.

DOUBLE CUTTING-OFF AND CENTER-DRILLING MACHINE.

Eastern Ship-Builders Busy.—The ship-builders of the United States are at the present time unusually busy. At the Cramps three large steam-ships are being constructed, and work is so abundant that they refused to put in bids for the new cruisers. At the Delaware River Shipbuilding Works at Chester six iron steamships are under construction. They are also building the hulls of the steel cruisers Bennington and Jamestown, the contracts for which were given to the Quintard Iron Works, who contracted with the Delaware Company for the building of the hulls. Both the Pusey & Jones Company and the Harlan & Hollingsworth Company are rushed with orders. The Eastern builders are also working to their full capacity, as are those on the lakes.

Material Progress in Europe.

Ex-President A. D. White, of Cornell University, who recently returned after making a prolonged tour of Europe, makes various interesting observations, chiefly relating to the growth and progress of European cities:

As to material progress abroad, I must say that few Americans have any adequate conception of it. The material and, indeed, moral progress in every European country, except Turkey, since I first knew Europe, is simply amazing. The leading cities have grown wonderfully and in the most magnificent way. To every one of them new suburbs have been attached, filled with beautiful public and private buildings, and there seems to have been a constant study to make the streets, sewerage, docks, parks and all other city necessities as perfectly fitted to the public health and comfort as possible. This is especially the case throughout Germany. Berlin, Leipsic, Stuttgart and a multitude of cities have grown with the greatest rapidity, splendor and with economy in administration. At Frankfort-on-the-Main there has just been erected a great general railway station unequaled in the world, compared to which our own vaunted Grand Central Station in New York is but a very poor thing. As to Austria, Vienna has been made perhaps the handsomest city in the world. As to Hungary, the new city of Buda-Pesth, having about 500,000 inhabitants, is, as I can judge by my own observation and as I am informed by the foremost American authority on the subject of city government, the most perfect specimen of its size on this planet. As to Italy, the cities under the old *régime* were vile, full of dirt, filth and squalor. Now they are clean and admirably organized. Rome is in every way vastly improved, Naples the same, and so, too, are Florence, Genoa and Milan. In France the lesser cities do not show a development so rapid and substantial as that of some of the other nations. But Paris has kept on in a wonderful career of growth. In England more progress is seen. London, since I first knew it, many years ago, has been wonderfully developed. The great Thames Embankment, perhaps the most important single city work in human history, and the great avenues which are now being cut through various parts of the metropolis, with the splendid buildings going up among them, are an honor to the Anglo-Saxon race. In Egypt, in spite of the wild extravagance of the late Khédive, there has come a new era. The present Khédive is a sensible, careful man, and although his country has to pay an enormous tribute to England and other nations in the shape of interest upon past loans, Egypt is unquestionably in a better condition than it has been for 6000 years. As to Turkey, matters seem to be steadily growing worse.

India has now 15,245 miles of railway, the mileage having nearly doubled in ten years and almost quadrupled in 20 years, while 30 years ago it was only 626 miles. Projects covering some 2300 miles have been ratified and a more rapid rate of increase is likely to be seen. The average capital expenditure thus far has been about $60,000 per mile. With its enormous area and its dense population India furnishes opportunity for a system of railways many times larger than it now has, and the Government and capitalists of England evidently appreciate the possibilities.

Prof. Lewis M. Haupt, of the University of Pennsylvania, chose for his subject before the Franklin Institute last week "Municipal Engineering," with reference to street pavements in this country and Europe.

THE WEEK.

Germany will not remove the restrictions on the importation of American hog products without a struggle. Meanwhile her toilers must be reconciled to a vegetable diet or pay dearly for meats.

The Underground Railway Company, in this city, offers to pay to the local government a liberal proportion of its gross earnings, conditioned upon the withdrawal of all opposition to the progress of the work.

Southern cotton-mills are no longer confining themselves to the manufacture of the cheaper grades of cotton goods. The Atlanta *Constitution* says that in Columbus and Augusta the evolution of the products of the cotton-mills has already begun, and, in the nature of things, must continue until every variety of the finest goods will be produced in the South.

The October exports from San Francisco exceeded $4,250,000, made up largely of salmon and canned fruits for England and Australia.

Pittsburgh has lost most of her South American trade within the last five years through English competition. James Rees & Son, the engine and boat builders, have just received an order for two steam-boat boilers and a pump to be shipped to Barranquilla, South America, and H. K. Porter & Co. get an occasional order for locomotives. A Pittsburgh paper says: "The steam-ship rates from New York are about four times the cost of sending the stuff from Pittsburgh to New York by rail. The transportation by sailing-vessels is about one-third less than on steam-ship lines. Notwithstanding this cheaper rate, we cannot compete with the English on account of the difference in the price of labor. The English manufacturers have secured drawings of American work and copied them. They have now got the idea of light-running steam-boats, and have in a measure stolen this trade from us. Another bad feature of the trade is that the Southern merchants want long credits. With some of them we have had to wait five years before we received our money. We could not stand this and had to quit it."

A cargo of graphite from Providence, R. I., the product of a newly-opened mine of remarkable purity, has been received by E. D. Ransom & Co., at Albany. Graphite is largely used for foundry facings and a large trade is anticipated.

The Cleveland Ship-Building Company have contracted for the construction of two more steel steam-ships, one for Capt. Thomas Walford, and the other, at a cost of about $175,000, to be a duplicate of boats that the same company are now building for the Lake Superior Iron Company. She will have keel 266 feet, beam 38 feet, hold 24 feet, with triple-expansion engines and all modern improvements, and will be ready for sea about July 1. The second is for a syndicate of Cleveland gentlemen. She will cost about $225,000 and be a duplicate of the Pontiac, with keel 300 feet, beam 41 feet, hold 25 feet, triple-expansion engines, &c., and to be ready August 1.

All the boats of the Union Ferry Company are to be fitted out with the patent steam steering-gear at a cost of $2500 a boat.

President Green, of the Western Union Telegraph Company, informed Postmaster-General Wanamaker that the company cannot do the Government business on the terms proposed, alleging that their acceptance would entail a loss of $4,000,000, the difference between the receipts and the actual costs. First Comptroller Matthews, in reply to a request from the Secretary of the Treasury, decides that the company became subject to the provisions of the order of the Postmaster-General fixing Government rates, and adds that all accounts which pass through his office will be settled on the basis of October 30, 1889.

One locomotive from the Altoona shops, in Pennsylvania, traversed the entire route of 6000 miles laid out for the International American excursion party, and came in at the station as fresh and powerful as when it started out 42 days before. It is known as engine No. 1053, class 0. Such an exploit is unequaled in railroad history. It is the general rule of railroad management that no passenger locomotive drawing a first-class train shall run a greater distance than 100 or 150 miles without being changed. Yet this locomotive has on several occasions covered 300 miles in good schedule time, and on the run from Omaha to St. Louis it made 476 miles in 18 hours.

The increase of commerce on Long Island Sound within a few years is remarkable, while, on the other hand, the Connecticut River is now almost entirely abandoned by sailing craft. Few vessels of any kind are now seen at Hartford, aside from the New York steam-boats and coal-barges. Even the latter will disappear when traffic by the Poughkeepsie Bridge is fully opened. The change within 50 years is remarkable. Persons who are by no means aged easily remember when, before railroads were built in the Connecticut Valley, they passed from Hartford to Springfield through the canal, embarking on the stern-wheeler Agwam, and if passengers chose to walk on the tow-path for a change there was nothing to prevent. A tin sign stuck up on the propeller was inscribed "No smoking abaft the wheel." Times have changed.

New York is a stirring city. During the month of October 2,507,608 passengers crossed the East River Bridge. This was an average of 113,148 per day, which would give an annual traffic of more than 40,000,000. Still more impressive are the statistics of the elevated railroad system, showing that during the year ending September 30 nearly 180,000,000 passengers were carried, which is an increase of 8,000,000 compared with the previous year. Of the total more than 68,000,000 passed over the Third-avenue line. In a very few years both the bridge and the railway will be taxed beyond their capacity and must be enlarged.

A committee of the Boston public schools appointed to investigate the subject recommend the establishment of a manual-training school and the erection of suitable buildings.

The Hansa Line of freight-steamers to Montreal will make Boston their winter terminus.

One of the delegates to the International Marine Congress at Washington spoke of the practice of the Transatlantic steamers in their attempts to cross the ocean quickly, and said the aim of some of them seemed to be "heaven, hell or New York inside of seven days." The conference decided that speed should be reduced in thick weather.

A million dollars has been subscribed for an elevated railroad in Jersey City, from Communipaw to the Bergen hillside, the cars to be moved by traction. President Cheney, of the Garfield National Bank, heads the enterprise.

Chicago proposes to construct a new drainage system in that city. Under an act passed by the last Legislature a drainage district has been established, and the taxpayers of the district are authorized to spend $60,000,000 in constructing a system which will take care of Chicago's sewage and give the city pure water. The commissioners to be elected December 12 have the power to employ 10,000 men a year for seven years, within which time the work must be completed. No municipality in this country has ever been authorized to spend so large a sum of money on a single improvement. It is more than five times the total debt of the city of Chicago. It is an average expenditure of over $8,000,000 a year for seven years.

The hemp growers in convention at Schaghticoke, N. Y., passed resolutions asking for a higher rate of duty to protect the industry. The domestic crop of 1889 produced from 12,000 to 15,000 tons and 100,000 tons were imported during the year. It was stated that of binders' twine alone 50,000 tons were manufactured last year. Mr. Hartshorn's new steam-power hemp-brake reduces the cost of freeing the fiber from wood to ¼ cent per pound, which, it is believed, will insure successful competition with foreign products.

The Thomas Jefferson Club Building, just commenced in Brooklyn, will have a front of molded brick and terra-cotta and a steep pitched roof with large copper dormers. The estimated cost is $150,000.

In anticipation of the probable adoption of smokeless powder by the United States Army, a 30-caliber rod bayonet Springfield rifle has been made and a magazine arm is in process of construction.

The Schlesinger Syndicate, which within a year has invested several million dollars in the purchase of iron mines in the Menominee district, has purchased the Buffalo, South Buffalo, Queen and Prince of Wales mines, near Negaunee, for a consideration aggregating about $800,000. This gives the syndicate an interest in the Marquette district which, with their other interests, will practically give them control of the non-Bessemer ore market. The purchase was made largely by Minneapolis capitalists, including John Paulsen, president of the State Bank of Minneapolis, C. C. Dunn, F. W. Jewett and E. J. Palmer. Others interested in the sale included Captain Bourne, James Gregory, the estate of the late Sheriff Anderson, of Negaunee, and Edward Loab, of Negaunee.

There is great excitement in Chattanooga over the announcement that the steam-boat A. C Conn, a Mississippi River craft, has passed through the Muscle Shoals Canal. This is the first vessel which has passed through the great canals now about completed. The construction of the canals to overcome obstructions in the Tennessee River at Muscle Shoals was commenced by the Government in 1873, and nearly $4,000,000 has thus far been expended on the work. The opening of the canals will give water transportation nine months in the year from Chattanooga to the Mississippi River.

The official report of the Knights of Labor, presented at the General Assembly in Atlanta, last week, shows that the total receipts for the fiscal year were $118,290.10. Mr. Powderly made various recommendations designed to promote the efficiency of the organization, which had passed successfully through an ordeal, but he stated plainly that without more encouragement the struggle would be in vain.

General Benet, Chief of Ordnance, in his annual report to the Secretary of War, makes the following estimates for the fiscal year ending June 30, 1891: "Sixty thousand dollars for machinery to complete the full capacity of the present gun-factory building at the Watervliet Arsenal; $248,743 to complete the building by the erection of the south wing; $848,570 for machine tools and fixtures of this wing; $400,000 for the manufacture of 50 12-inch B. L. rifled mortars, cast-iron, hooped steel; $225,000 for mortar-carriages; $125,000 for forgings for one type 16-inch B. L.

gun; $200,000 for steel-armor-piercing projectiles for sea-coast guns; $25,000 for steel shell for sea-coast cannon; $70,000 for finishing and annealing 8-inch, 10-inch and 12-inch guns; $143,150 for 75 metallic carriages for field-gun batteries; $25,000 for 25 steel field-guns of 3.2-inch caliber and $5000 for machinery and plant for the manufacture of steel shrapnel for field-guns."

The Catholic University at Washington city, dedicated on the 13th inst., will form an imposing pile when the entire group of buildings is completed, as the separate structures will number seven, all of large dimensions. The Divinity Building is the only one erected at present. In the center will be the Hall of Science, or physical laboratory. To the right and rear of the Hall of Science the observatory will occupy a high knoll, and at the front, on the opposite side of the park, the Library Building will stand. A large church, or university chapel, will be erected on the north between the park and the Divinity Building, with which it will be connected by an arcade. The high grounds adjacent to the Divinity Building will be reserved as sites for colleges that may be erected by religious orders in connection with the university. The biological and medical laboratory will occupy a position in the south front of the grounds. On the right of the physical laboratory building or Hall of Science will be the building to be used for the classes in law and letters. A botanic garden, with conservatories, will occupy the west front of the grounds.

The window-glass manufacturers of Ohio and Indiana have formed an association to maintain prices, and have elected Thos. F. Hart, of Muncie, president. Fifty factories are included.

An appropriation of $284,000 for the Brooklyn Navy Yard is recommended by Commodore White, of the Bureau of Yards and Docks, in his annual report.

The Missouri anti-trust law went into effect on the 14th inst. A St. Louis special says: "The lead companies of St. Louis have proceeded within the law. They have filed an affidavit with the Secretary of State complying with the provisions of the law, and there is no danger of forfeiture of their charters. Stockholders have placed their stock in escrow against trust certificates and are to all intents and purposes doing business as before." Another dispatch says: "The Secretary of State will proceed at once to revoke their charters. Secretary Lesur and assistants have been kept busy filing acknowledgments of receipt of affidavits, and it will be several days before the list of delinquents will be ready for publication."

The assessment returns of the Southern States for 1889 continue to improve. Six Southern States have now completed, or very nearly completed, their assessments for the present year, and make the following showing:

	Assessment for 1889.
Alabama	$242,197,531
Georgia	380,189,314
Louisiana	223,394,756
*Mississippi	157,830,431
South Carolina	145,290,344
*Tennessee	356,456,761

* Some few counties estimated.

Assessments of the same States in 1888, $1,694,267,253; improvement, $111,091,884, or nearly 6 per cent.

A vineyard-owner in California says Spain is no longer a competitor of the United States in the raisin market. "One acre in our country will produce more grapes than three Spanish acres, and no climate is equal to ours for curing raisins. California has not only conquered the American market, but is stretching out for the markets of the world."

MANUFACTURING.

Iron and Steel.

In some of the Pittsburgh papers last week appeared a statement to the effect that Park, Brother & Co., Limited, proprietors of the Black Diamond Steel Works, in that city, had received an order from the Government of Peru for 300,000 pounds of steel. Advices from the firm are to the effect that there is no truth in the report whatever.

The Whitaker Iron Company, of Wheeling, W. Va., are operating their plant to its full capacity. The company are putting in an electric plant which will comprise 30 lights of 2000 candle-power each. The Westinghouse system is the one adopted.

The plant of the Standard Iron Company, at Bridgeport, Ohio, manufacturers of sheet-iron and sheet-steel, is being operated full time. Three months ago the warehouse of this firm was stocked with corrugated iron that it was supposed would last through the season. At present the stock is nearly exhausted and orders are on hand for more than was then in the warehouse.

The Clinton Iron and Steel Company, operating the Clinton and Millvale Mills of Graff, Bennett & Co., at Pittsburgh, are making some extensive repairs and additions at the first-named works. A new battery of boilers and two double heating-furnaces are being put in, and work will soon be commenced on the remodeling of their Clinton blast-furnace. This furnace was built in 1859 and is 45 x 12, but the company will increase the size to 72 x 14½, which will add considerably to the capacity of it. The report that a new furnace would be built and that the company would operate two furnaces is without foundation.

A meeting of the Executive Committee of the Monongahela Furnace Company, of McKeesport, Pa., was held in Pittsburgh last week for the purpose of discussing some details in connection with their plans and to award one or two small contracts. This firm are erecting two furnaces at McKeesport which will have a capacity of at least 200 tons per day each. The furnaces are to be 20 x 80 feet, equipped with seven stoves of the Cowper-Kennedy type, five E. P. Allis & Co. blowing-engines, 42-inch steam-cylinders, 84-inch air-cylinders, 60-inch stroke. The boilers will be 32 in number, all steel, 54 inches in diameter, 30 feet long, with two 18-inch flues. One of the furnaces will probably be completed by the 1st of next July and the other one very shortly after that date.

It is stated that the Merion Iron Company, of West Conshohocken, Pa., have sold all the pig-iron about the furnace to J. Wilson & Co., of Philadelphia. It consists of about 5000 tons and will be shipped away at the direction of the purchasers. There is very little likelihood of the furnace being started again until the estate of the late J. B. Moorhead, president of the company, is settled up.

The Pittsburgh Bridge Company, of Pittsburgh, have in contemplation quite a number of improvements about their works. In the spring they will erect a two-story building, 50 x 200 feet, for a machine and pattern shop. The firm have a large number of orders on hand on account of having received the contracts to replace the bridges over the Conemaugh River that were swept away by the Johnstown flood.

A. Pluemer, of Cincinnati, has been appointed permanent receiver of the Etna Iron Works, of Scranton, Ohio.

The wages of the employees at the blast-furnaces of the E. & G. Brooke Iron Company, Limited, at Birdsboro, Pa., have been advanced 10 per cent., taking effect on the 13th inst. The Warwick Iron Company, of Pottstown, Pa., have granted a similar advance to their furnace employees.

The Norton Iron Works, of Ashland, Ky., declared a semi-annual dividend of 3 per cent. last week.

Hecla Furnace, of the Hecla Iron and Mining Company, which has been out of blast for some time, resumed operations on Monday, the 11th inst.

On the 11th inst. the laborers at the sheet mills at New Castle, Pa., were notified that their wages would be increased 10 cents per day, taking effect on that date. The increased was unsolicited.

D. R. Lean, engineer and contractor at Pittsburgh, has received a contract for the erection of three heating-furnaces for the Lansing Bridge and Iron Works, at Chicago. These will be equipped with Wellman gas-producers, and will be used for heating eye-bars for bridge-work. Mr. Lean is also engaged in remodeling the Bessie Furnace of the Columbus and Hocking Coal and Iron Company, at New Straitsville, Ohio. Three Whitwell stoves are being taken out and will be replaced by three of the Cowper-Kennedy design. The old stoves were 38 feet in hight, while the new ones will be 52 feet high. These improvements will add considerably to the capacity of the furnace.

The Morehead-McCleane Company, proprietors of the Soho Iron and Steel Works, at Pittsburgh, have commenced the erection of a new sheet-mill, which when completed will greatly increase their capacity for the production of their well-known brand of C. H. B. sheet-iron. Employment will also be given to a large number of additional hands. The firm are also engaged in remodeling their old armor-plate mill, throwing out the reverse motion heretofore used and increasing the speed and efficiency of the mill by the introduction of reversing rolling-mill engines of the most approved pattern, which will about double the tonnage of the plant. The balance of the plant of this firm is being operated to its full capacity, and the outlook for the future is exceedingly bright.

The Carbon Iron Company, of Pittsburgh, have commenced the erection of eight reducing-furnaces. Including two Lash open-hearth furnaces and the buildings, with hydraulic cranes, ladles, machinery, railroad-tracks, &c., the improvements will cost in the neighborhood of $100,000. The additions will give the firm a daily capacity of about 200 tons of open-hearth steel ingots, which the large universal mill of the firm can more than take care of. The completion of the reducing-furnaces will give them a capacity of about 84 tons of squeezer blooms per day, these being made direct from the iron ore. From this it is evident that the making of iron and steel direct from the ore by this firm has passed the experimental stage and is now a perfect success. The superior quality of iron and steel produced has gained an enviable reputation, not only among consumers of bridge and structural steels, but among expert metallurgists as well. The company have furnished all of the universal plates and eye-bars for the Merchants' Bridge, at St. Louis, in all about 3000 tons, the eye-bars being among the heaviest which were ever put into a bridge.

On Wednesday, November 13, at the works of Sanderson Brothers Steel Company, Syracuse, N. Y., a large fly-wheel on the engine of their 12-inch roll train burst. Segments of the rim of the wheel were thrown upward through the roof, coming down in another part of the mill,

one piece striking a man and killing him instantly. The damage to the roof was considerable, but the remainder of the plant was uninjured, and after a stoppage of a few hours all other departments of the works resumed operation as usual.

For some time past negotiations have been in progress whereby Fayette and Harvey H. Brown, D. W. Chambers and R. W. Hickock, of Cleveland, and Samuel McClure and E. W. Budd, of Sharon, Pa., have purchased a controlling interest in the plant of the Stewart Iron Company, Limited, at that place, and also in their coke-ovens and coal lands at Uniontown, Pa. The iron plant is a large and valuable one. It comprises 46 acres of ground in the southern part of the borough. Four acres of it are occupied by a rolling-mill, 60 x 336 feet in size, two blast-furnaces, two casting-houses, machine, blacksmith and carpenter shops, stock-house, office, &c. The former officers of the company were: David Stewart, New York, chairman; Fayette and Harvey H. Brown, Cleveland, manager and assistant manager, respectively, and Theodore Hicks, New York, secretary. A new board of managers have been elected. It is composed of the Messrs. Brown and Hickock, of Cleveland, and S. McClure. The last-named gentleman, who has been manager of the plant for some years, will continue in that capacity.

The De Bardeleben Coal and Iron Company, of Bessemer, Ala., are to build two additional blast furnaces at that locality.

The Rockdale Mining and Mfg. Company, of Nashville, Tenn., have commenced the construction of a charcoal furnace at a point 18 miles south of Columbia, Tenn.

The Samson Steel Forge Company, of Chicago, have filed a certificate decreasing their capital stock from $100,000 to $25,000.

The Illinois Steel Company have purchased 60 acres of land adjoining their South Chicago works, making a total in the tract of 160 acres. The ground thus acquired is intended for the extension to the works and will be partly occupied by four blast-furnaces, which will make a total of eight in the plant. The foundations are now being laid. The new furnaces will have a much greater capacity than the old ones.

The Premier Steel Company, composed of prominent Indiana capitalists, are conducting experiments with a new process for making steel at the Indianapolis Rolling Mill Company's plant. The process is reported to be a modification of the method at one time tried by the Blair Iron and Steel Company, at Pittsburgh.

In the issue of *The Iron Age* of November 7 we printed the fact that the boiler explosion at the Bellaire Nail Works, Bellaire, Ohio, had not created the heavy damage which the press reports gave out. We were officially advised that it amounted to only $4000, while the press reports made it $200,000. By an accident the original press report was printed in a department of *The Iron Age* in which news of this character does not generally appear, and thus it escaped the attention of the editor.

The Pioneer Mfg. Company, Birmingham, Ala., have contracted with I. P. Morris & Co., of Philadelphia, for two additional beam blowing-engines for their plant of two furnaces. The second furnace is now approaching completion and will be ready about February 1. When the two engines referred to are completed each furnace will have three engines. It is believed that then the capacity can be carried up from 850 tons a week, now reached, to 1000 tons for each weekly

Machinery.

Wm. Fisher, proprietor of the Fisher Foundry and Machine Works, at Pittsburgh, shipped on the 9th inst. a 16-ton roll-turning lathe to the Illinois Steel Company, at Chicago. The lathe is about 20 feet long over all and will swing a roll 13 feet long by 40 inches in diameter. He is also about to ship a 14-ton grinding-pan to a firm in Tyrone, who already have four of these pans in operation giving satisfaction.

The Goulds, Austin & Caldwell Company, of Chicago, dealers in pumps, pipes, fittings, brass goods, &c., have taken the necessary steps to have the name of the corporation changed to Goulds & Caldwell Company.

The Capitol Mfg. Company, Chicago, have in the last few days received orders for four (two double and two single headers) of their Adams automatic bolt-threading and nut-tapping machines.

The Great Western Pin Company, of Toledo, Ohio, pay especial attention to the manufacture and erection of rope transmissions. They claim the following advantages for ropes over belts: They do not slip on the pulley, they turn all angles easily and smoothly and power can be transmitted to any distance.

The extensive works of the Stiles & Parker Press Company, at Middletown, Conn., are being enlarged by the addition of another building covering 100 feet.

The Springfield Glue and Emery Wheel Company, of Springfield, Mass., have been superseded by the Springfield Emery Wheel Mfg. Company, who will carry on the extensive business in the production of emery-wheels and the great variety of grinding machines made by the old company. New works are now being erected at Bridgeport, Conn., to which place the business will be transferred about February 1, 1890.

Hardware.

Geneva Tool Co., Geneva, Ohio, report that they are running full of orders, trade having increased with them largely since last year. The prospects for business for the coming season are referred to as very good.

Nashville Spoke and Handle Co., Nashville, Tenn., advise us that they have appointed Surpless, Dunn & Alder, 97 Chambers street, New York City, their representatives for the sale of their spokes and handles, and that all communications addressed to them will receive the same attention as if sent to the factory.

Miscellaneous.

A company is being organized under the title of the Bronze Rolling Mill and Aluminium Company, with a capital of $5,000,000, to work the process of F. M Hill, 468 Cherry street, New York. The concern has a mill at Findlay, Ohio.

Among the corporations chartered by the State of Illinois during the past week are the following: Rock Falls Electric Company, at Rock Falls; for lighting, power and heating; capital stock, $25,000; incorporators, A. C. Stanley, J. M. Bickford, B. F. Kadel. Mullins' Silacator Copper, Brass and Bronze Company, at Chicago; to use a patent burnishing process in bronze; capital stock, $250,000; incorporators, C. T. Trezo, D. T. Cameron and Williston Fish. Charles F. Stokes Mfg. Company, at Chicago; to manufacture and sell bicycles, sewing-machines and type-writers; capital stock, $100,000; incorporators, Charles F. Stokes, C. H. Sieg and A. L. Collins. Jacob's Company, at Chicago; for the sale of plumbing apparatus and machine work; capital stock, $6000; incorporators, Theodore Jacobs, C. H. Simmons, W. M. Lemoyne. Chicago Aluminum Producing Company, at Chicago; to manufacture aluminium and alloys; capital stock, $600,000; incorporators, W. C. Bruson, H. Booth and H. P. Hurd. Atlas Mfg. Company, at Chicago; to do a plumbing business; capital stock, $75,000; incorporators, C. H. McDowell, S. F. Mounteer and E. Geissler. Black Enamel Mfg. Company, at Chicago; to manufacture and sell black varnishes and japans, &c.; capital stock, $1000; incorporators, A. Freeman, A. A. Morrill and Susie A. Johnson.

New Polytechnic School.— A polytechnic school to be known as the Lewis Institute is to be established in Chicago. The fund for its establishment was devised some ten years since by Allen Lewis, of that city, who left his property at his death in the hands of trustees to be devoted to the erection and sustenance of a polytechnic school and its necessary appurtenances when the estate should amount to $800,000. The fund now amounts to over a million dollars, and it is the intention of the trustees to erect a building next year and open the school as early as practicable. Girls are to be instructed in certain branches of art and young men are to receive instruction which will be useful to them in earning a living. According to the terms of the bequest, the trustees are to provide a large lecture-room or hall and fine reading-room or rooms and all necessary study-rooms to carry out the plan; the building when completed, together with the premises, to be forever devoted to the purposes specified and thereafter to be known as the Lewis Institute; and upon its completion the trustees are to invest not over $50,000 in the procuring of books, papers and pamphlets for the library and the necessary fixtures, designs and apparatus for the studies and other rooms. The trustees are also to procure all necessary librarians and teachers. The design of the founder of this institute was most commendable, and if the trustees carry out his wishes in a wise and judicious manner Chicago will in coming years have in it an educational institution of very great value.

Secretary Tracy has awarded to the Bethlehem Iron Works, South Bethlehem, Pa., two contracts for wrought-steel to be used in the construction of cruisers 7 and 8, to be built in the New York and Norfolk Navy Yards, at $7476 each. Two contracts for rivets for the same cruisers were awarded to the Oliver Iron and Steel Company, of Pittsburgh, at $7840 each.

Cooper, Hewitt & Co. have decided to adopt the method of stripping which has been so successful at the Tilly Foster Mine. At the Peters Mine, Ringwood, N. J., they have four overlying veins, from which they have taken as much ore as it is safe to extract by under-ground working. It is estimated that they can recover about 100,000 tons of ore left in pillars by stripping more cheaply than in any other way. F. H. McDowell, of 120 Liberty street, this city, is in charge of the work.

The United States Construction Company, P. A. B. Widener, president, have contracted to construct cable-motor lines in Baltimore for the Traction Company, of that city. The cost of the work is estimated at $3,000,000.

The Western and Northwestern divisions of the Western Freight Association have requested the Wisconsin Committee to take special action in regard to putting their pig-iron rates in conformity with the rates recently established from Chicago. It is likely the Central Traffic Association will be consulted before the rates are entirely adjusted.

The Iron Age

New York, Thursday, November 21, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Great Pig-Iron Competitors.

Recently-published statistics enable us to perceive definitely how the production of pig-iron in the United States is overtaking that of Great Britain. The gap between the two countries, which was at one time so very wide, has been rapidly closed, and they are now abreast. After that this country, with its vigorous growth and unlimited possibilities, will undoubtedly be permanently in the lead. The total production of all kinds of pig-iron in the two countries in the past three half-years has been as follows, in gross tons :

Periods.	Great Britain.	United States.
First half 1888.....	3,902,804	3,020,092
Second half 1888.....	3,995,830	3,469,646
First half 1889.....	4,083,597	3,667,767

The excess of the British over the American output in the first half of 1888 was 882,712 tons; in the second half of 1888 it was 526,184 tons; but in the first half of 1889 it was only 415,830 tons. In these three periods of comparison the increased production of Great Britain has been only 180,793 tons, while in the United States the gain was 647,675 tons. The entire 18 months covered a time of dull trade, comparatively speaking, in both countries, but nevertheless the pig-iron industry grew remarkably here, while it remained practically stationary with our competitors. Now that an active demand has set in on both sides of the Atlantic, a season of rapid expansion is to be expected, in which the present relative positions of the two countries may be maintained for some little time until our new furnaces begin to count heavily in our favor.

The productive capacity of British furnaces is unknown, but it may be presumed to be from 20 to 25 per cent. in excess of their largest year's output. That was attained in 1882, when 8,586,680 gross tons were produced. The largest twelve-month's output of American furnaces was that of the last half of 1888 and the first half of the present year, which aggregated 7,137,413 gross tons. The difference between the maximum American and the maximum British production for 12 months was thus 1,449,267 tons. The ample margin which our furnace capacity presents for an expansion of output is shown by a statement just issued by the American Iron and Steel Association, which places the annual capacity of existing American furnaces at 11,757,350 gross tons. There are also 29 furnaces in course of erection in this country, with an estimated annual capacity of 1,075,000 gross tons, exclusive of four furnaces projected at Chicago but not yet under way, which will bring the grand total up to 12,832,350 tons to be obtained during the coming year. If these furnaces can then be operated within 25 per cent. of their capacity, which seems reasonable if the demand for pig-iron should justify such activity, the United States can then turn out over 9,500,000 tons, or about 1,000,000 tons more than the furnaces of Great Britain have yet attained. With the past achievements of the American iron trade in mind it appears altogether probable that this will be accomplished in a very few years.

In considering the relative growth of the pig-iron industry of the two countries it should be borne in mind that they are very differently situated as to stocks, and also that a great change has occurred in their trade relations toward each other. British furnaces had a stock of unsold pig-iron on July 1 of 2,230,868 tons, while American furnaces had but 502,934 tons on hand at that time. These large British stocks must necessarily prevent a very heavy expansion of output, which might be the case if there was no reserve to be drawn upon in the present time of active demand, whereas the American stocks were too small to clog the movements of producers on this side of the ocean. Again, in all previous periods of active trade here we have been heavy purchasers of British pig-iron, and have thus helped to increase the output of British furnaces, whereas we were lately almost able to ship pig-iron to Great Britain. Unless a decided change in prices takes place very soon the American furnaces will have to meet the entire American demand for pig-iron and thus increase production here much beyond what would have been the case if the old conditions prevailed. The next year or two will be full of interest for those who are looking forward to American supremacy in the world's iron trade.

Legislation on Bankruptcy.

Two bills of a totally different character are to be strongly pushed by their respective advocates before Congress this winter, when the question of legislating on the subject of bankruptcy is brought up. They are known respectively as the Torrey and Bonney bills, and both of them have been approved by representative bodies of business men, so that each has a very reputable following. The Torrey bill is explained as a method of winding up a bankrupt's business without regard to his future. The interests of the creditors are regarded solely, and the bankrupt's estate is to be handled so as to get as much out of it for them as possible. The Bonney bill, on the other hand, gives the court of jurisdiction the "power to grant extensions of time for payment and to reduce the amount of indebtedness pro rata for the purpose of allowing the debtor to proceed with his business, if it shall seem best to do so." Under the Bonney bill an unfortunate business man would be given a chance to redeem himself and to regain his lost footing. The Torrey bill, it is understood, presents no such opportunity for leniency on the part of the court, but hands him over entirely to the mercy of his creditors. If such safeguards can be established as seem to be necessary to avoid abuse the provision for extensions in the Bonney bill is certainly a strong argument in its favor. A business worth preserving can thus be sustained and may ultimately realize much more for the creditors than if the unfortunate debtor had been mercilessly pushed to the wall and wholly deprived of his opportunities to make a living for himself and money for those to whom he owes it. Possibly many bankruptcies could thus be prevented through the relief afforded by the application of an embarrassed business man to the court, and money would be saved for all parties concerned. But it is almost impossible to foresee the after-effects of legislation, plain as the immediate result may be, and if abuses were to grow out of such a provision of law, so that shrewd and unscrupulous men could at any time scale down their indebtedness from 25 to 50 per cent., through a careless or over-lenient judge, it might be a cause of profound regret that the interests of debtors were so considerately guarded.

The Eight-Hour Day.

It is one of the paradoxes of human nature that the poorest-paid workers do not strike and do not agitate for shorter hours of labor. Those who are well paid for their work and are employed the fewest number of hours manifest by strike and agitation the strongest desire to further improve their condition. Those who make cheap clothing, the poor sewing women, whose earnings are worse than beggarly, because a beggar would scorn his business if it yielded such returns, would create the greatest sensation that has taken place in the working world if they were to strike. Sometimes, though not often, workingmen are goaded to strike through desperation because their wages are too meager to live on, but the great majority of strikes and labor troubles occur among those who have been able to lay by a little fund, and in many cases a pretty handsome fund. It is this last class of workingmen who are chiefly instrumental for the agitation now being carried on in favor of an eight-hour day. The last convention of the American Federation of Labor, which was held at St. Louis, pronounced in favor of the establishment of an eight-hour workday on May 1, 1890, and it is expected that the next convention, which will meet at Boston on the 10th of December, will take decisive steps to secure its realization. The American Federation of Labor is now the most powerful labor organization in existence since the decadence of the Knights of Labor, and it is to be hoped that its leaders will not be so short-sighted as to seriously attempt to force a general settlement of this question at the time mentioned. The eight-hour movement has been making progress, advancing along lines of least resistance, and will probably continue to gain in occupations in which its introduction will not work hardships to employers or injuries to business. The genius of the age is in favor of alleviating the condition of those who are obliged to support themselves by labor. But an attempt to crowd the settlement of this stupendous question into a few months and to take effect on a fixed day will be as futile as all such efforts have been in the past.

If our own Southern furnaces were not so busy there would be a chance to ship pig iron to England in small lots, freights from Southern points being available at about 5 shillings per ton.

The English Iron Market.

Many disinterested observers on this side have insisted that the pace abroad is altogether too fast. From a synopsis of opinions of English investors, printed in the London *Ironmonger*, it appears that a large constituency in the trade there look forward to heavy orders from this side of the Atlantic. The market report in the last issue of our contemporary reflects that view, since it refers to an "overflow" demand from the United States as a possibility. Though couched in cautious terms, it is possible to read between the lines that the contingency referred to is not regarded as very remote. At the time our contemporary was writing Bessemer pig was selling at 72 shillings, which would make the cost laid down in New York at least $26.50. Good brands of Scotch iron were fully $27, while warrants were selling at 60 shillings. Even with American Bessemer at $19 at furnace and Foundry iron at $18 at furnace, or $20 and $19 respectively at tide-water, sales of foreign could be made only after there had been a very heavy advance here, an advance far less likely to occur than the maintenance of English quotations at the highly speculative level reached.

How rapid the advance has been will be readily seen from the following table of daiiy closing prices for Scotch and Middlesborough warrants since the middle of September:

Prices of Scotch and Middlesborough Warrants.

		Scotch warrants.		Middlesborough warrants.	
		s.	d.	s.	d.
Sept.	14	46	6	43	7½
	16	47	2	43	9
	17	47	4	43	10½
	18	47	4	44	.
	19	47	5	44	.
	20	47	7	44	.
	23	48	2	44	3
	24	48	2	44	6
	25	48	10	44	9
	26	48	10	44	10½
	27	49	8	45	.
	30	50	1	45	3
Oct.	1	49	9	45	3
	2	49	8	45	3
	3	49	8	45	3
	4	51	2	45	4½
	7	51	6	46	6
	8	52	3	47	6
	9	53	3	47	6
	10	53	5	47	6
	11	54	2	49	6
	14	55	2	50	.
	15	54	9	50	6
	16	55	2	50	6
	17	55	6	50	6
	18	54	8	50	6
	21	54	8	50	5
	22	54	3	51	.
	23	55	4	51	6
	24	55	7	51	9
	25	56	1	53	.
	28	58	3	65	3
	29	59	3	58	.
	30	59	3	58	3
	31	58	11	58	.
Nov.	1	57	2	56	2
	4	58	8	58	3
	5	58	6	58	.
	6	59	.	58	11
	7	59	5	60	.
	8	59	11	60	6
	11	61	11	63	9
	12	62	11	67	3
	13	63	.	67	6
	14	62	6	65	.
	15	63	2	65	6
	18	63	8	66	.
	19	63	8	68	6
	20	62	9	66	6

A year ago Scotch warrants fluctuated between 40 and 42 shillings during the months under review, and they are usually not less than 5 shillings higher than Middlesborough pig, and often the difference is much greater. The most extraordinary feature of the advance during the past month has been that this difference has not only been wiped out, but that the Middlesborough iron has risen to figures considerably above the quotations for Scotch iron. Mail advices, notably the discussion of the situation in the leading trade and financial newspapers, reflect the conviction that even a further advance is likely. Since these reports, dated from the first week in this month, the facts have certainly borne out their predictions to a considerable extent. But it is evident that speculation has become the dominant element in the situation, and under the circumstances the most violent reactions are probable.

As our market looks to-day the English bulls can expect no support from this side for the balance of this year. How matters will shape early in 1890 is still a matter on which opinions differ quite widely. An advance is confidently expected, the principal question in doubt being whether it will be moderate or whether there will be an excited market, accompanied by all the characteristics of a boom. But without the latter, to which a very large and conservative element is actively opposed, our English cousins cannot hope for any orders unless their price drops back very considerably. Large importations are not possible unless the two markets approach one another. What danger the future may bring lies in a sharp reaction in England simultaneously with a heavy rise here. In that way the difference may be split, which, as will be seen by a comparison of prices, is now about $6 to $7 a ton. With Durham coke at close to $5 a ton in England, and the wage-earners openly avowing adherence to a policy of restriction, with the view of clearing away stocks of pig-iron, the prospect of a material cheapening in the make on the other side is not very great for the immediate future, whatever speculators may conclude to do.

The Brazilian Revolution.

Brazil being the South American country with which the United States transacts the largest business, the sudden extinction of the monarchy there is for ourselves an event of the first magnitude. It is so not only from a commercial point of view, but quite as much politically, inasmuch as there are now only the colonies of European nations in America which are not republics. What has happened, therefore, harmonizes the political system so preponderating in this hemisphere and clearly foreshadows the tendencies that will be strengthened in the colonies.

So long as slavery still existed in Brazil and the interests of planters were bound up with Dom Pedro's conservative monarchy, the word "republic" was hardly ever mentioned. On May 13 the Princess-Regent—while her father was sick in Italy—signed the decree of emancipation without compensation to the planters, and soon after republican agitation was fostered. It was hushed, however, after Dom Pedro's return, who, seeing the drift of things, formed a liberal cabinet in June last, under Viscount Ouro Preto. The Chambers were dissolved, and the August elections returned 110 Liberals, 11 Conservatives and 4 Republicans. The latter were discouraged, while the planters—in view of the prosperous finances—even had some solid prospects that compensation for the loss of their slaves would be doled out to them by some new issue of bonds. There was one disquieting feature, however, that had been noticed for some three years past—a deplorable lack of discipline in the army. Still, Dom Pedro had so much confidence in his own popularity and the well-known conservative spirit of Brazilians that he quashed the court-martialing of General da Fonseca, the very ringleader who has just engineered the military revolt at Rio and deposed the man who in his weakness and good-nature had interceded in his behalf. Da Fonseca and a few followers had the boldness to attempt the *coup de main*, and it succeeded.

Dom Pedro is now on his way to Lisbon to swell the number of exiled European and other rulers, and the cable tells us that "the United States of Brazil" are born; that nothing will be changed in the general administration of ex-provinces, in future confederated States, except the governors, who were till now always military men appointed by the general Government, and who in future will be locally elected. We also hear that the provinces without an exception adhere to the republican form, if not with enthusiasm at least with a quiet resignation. There is no trouble, nor is it likely that there will be, the Brazilians, like the Portuguese, not being given to political plotting like most Spanish-Americans. As it was a foregone conclusion that on Dom Pedro's death the republic would succeed the empire, the success of this military plot is probably the best that could have happened. It is so all the more as Brazil prospers, being enriched by high coffee prices. The finances were never in a better condition, the incubus of slavery has vanished and planters and merchants have not got the time to trouble themselves about politics. Hard-working South Europeans are pouring into the wealthy coffee provinces at the rate of 150,000 per annum, and Brazil has a better future before it than it ever had. This being the case, we see little cause for running up the price of coffee and India rubber, since nobody will interfere with either. Whether Fonseca, the Boulanger of Brazil, and his understrappers will long remain in power is doubtful. The new constituent assembly is to be convoked. It will frame the federal constitution, which may take several months to accomplish, and a modified suffrage will decide as to the most capable men that are to rule the new order of things. Sudden as both emancipation and the change of system burst upon Brazil and the world at large, we sincerely believe that the new era will be a most promising one, and that our export to Brazil can only be a gainer by it.

The statement made in *The Iron Age* October 24, page 642, that the Illinois Steel Company had declared a dividend of 3 per cent. out of their earnings for the past six months, payablein December, was incorrect. The report was founded on a misunderstanding.

The fastest steamships among the "record breakers" will soon cease running for the winter except the Inman Line steamer City of Paris, which will settle the question whether vessels of her class can be kept in service profitably the year round.

MECHANICAL ENGINEERS.

NEW YORK MEETING.

The twentieth meeting of the American Society of Mechanical Engineers began on Monday evening, the 18th inst., with a sort of house-warming, held at the rooms of the society, 64 Madison avenue, this city. Some 300 members and guests assembled and were received by a committee of ladies in the library of the rooms. A most enjoyable evening was passed.

The first business session began at the hall of the New York Academy of Medicine, a place most admirably adapted for such purposes, and at that time the register showed some 200 signatures of members and guests, as follows:

H. R. Towne	W. H. Wiley
F. R. Hutton	D. Ashworth
R. Cartwright	L. W. Cole
H. H. Supplee	H. P. Minnott
A. Swasey	W. S. G. Baker
W. R. Warner	H. R. Barnhurst
A. A. Cary	J. M. Smith
C. J. H. Woodbury	F. H. Ball
H. G. Morris	C. Kirchhoff, Jr.
B. D. Whitney	W. M. Whitney
L. G. Skinner	W. Kent
H. W. Spaugh	G. R. Stetson
J. A. Gilkerson	C. Sperry
W. C. Jones	D. K. Nicholson
C. S. Beach	N. A. Ramsay
F. H. Laforge	W. W. Wilkin
G. R. Cullingworth	E. P. Stratton
C Sellers	J. W Pulock
J. Hennery, Jr.	G. L. Fowler
W. B. Tucker	D. S. Jacobus
G. S. Percival	A. C. Campbell
W. S. Rogers	W. W. S. Rogers
A. Faber du Faur	C. Thomas
G. H. Babcock	T. P. Conant
G. R. Simpson	O. C. Woolson
A. B. Bates	T. R. Almond
H. M. Montgomery	E. W. Naylor
G. Hillman	J. K. Hallock
W. P. Trowbridge	W. J. Baldwin
T. S. Crane	L. B. Moore
C. Steel	F. H. Hayward
A. W. Jacobi	F. M. Leavitt
G. W. Weeks	C. C. Worthington
A. Victorin	N. C. Bassett
C. W. Pusey	C. W. Nason
H. B. Miller	P. R. Voorhees
C. J. Ulmann	G. H. Smith
A. Krause	F. C. Fladd
F. E. Drown	W. C. Lyall
L. F. Lyne	A. C. Christensen
L. R. Alberger	E. H. Parks
J. F. Lewis	J. M. Rusby
J. E. Wilson	A. J. Caldwell
A. Stewart	Scott A. Smith
C. H. Smith	G. M. Bond
C. H. Corbett	E. A. Uehling
J. W. W. Cloud	J. T. Hawkins
C. M. Morse	C. H. Peabody
W. S. Doran	A. Miller
O. W. Febri	S. Taylor
A. W. Colwell	A. Fletcher
W. D. Dickey	T. J. Shaw
W. H. Pierce	C. A. Hague
C. M. Russell	J. Thomson
W. V. Gould	J. F. Lockwood
W. W. Bird	S. J. Charles
Geo. I. Allen	W. S. Russel
M. A. Müller	J. T. Henthorn
B. H. Warren	D. L. Barnes
W. E. Partridge	W. Barnet LeVan
B. Cruikshank	John Dick
Robt. Allison	H R. Cornelius
H. I. Snell	A. Christiansen
C. B. Rowland	C. S. Dutton
G. Rowland	C. H. Morgan
S. McElroy	T. S. Miller
W. Hill	H. L. Gautt
F. L'H. Eberhardt	G. M. Sinclair
G. H. Burpee	S. T. Wellman
W. H. Fletcher	H. F. J. Porter
J. H. Webster	W. P. Dallett
F. Grinnell	A. Falkeman
F. C. Sheldon	F. R. Low
H. Tabor	J. F. Holloway
C. W. Hunt	Oberlin Smith
R. H. Thurston	W. E. Ward
Horace See	E. Burdsall, Jr.
H. de B. Parsons	V. G. Hazard
W. W. Christie	H. M. Montgomery
C. O. Heggem	K. J. Sunstrom
G. E. Whitehead	S. F. Gold
C. E. Hyde	T. J. Borden
W. Simpkin	F. M. Wheeler
I. B. Coleman	A. T. Barnes
F. E. Idell	F. W. Skinner
W. C. Lambert	A. Stearns
W. E. Crane	J. L. Horing
W. H. Jenks	L. A. Upton

The address of the president, Henry R. Towne, was divided into three parts or topics. A concise and entertaining description was first given of the trip abroad by the civil, mechanical, mining and electrical engineers last summer. Mr. Towne told where the invitation came from, how it was received by the societies of this country, and in brief outlined the principal places visited in England, France and Germany, dwelling with particular stress upon the marked cordiality of the engineers of those countries in their treatment of those from the United States.

The second topic considered was the exhibition proposed to be held in 1892. It was shown that international expositions, with the single exception of that at Vienna, had in each case surpassed previous ones; and it therefore became imperative that the exhibition proposed by this country should be unprecedented in all respects in order that we may present a creditable showing to foreign nations of our ability as designers, managers and executors. In regard to the French exposition, it may be possible for American engineers and architects to equal it, but it will not be possible to surpass it, except, perhaps, in the one branch of engineering.

An estimate founded on the growth of exhibitions since that held in London in 1855 shows that the proposed one should have an acreage under cover of from 90 to 100, and would in all probability have an attendance of from 35,000,000 to 40,000,000. The conditions now are decidedly more favorable than they were previous to 1876, when the Centennial Exhibition was inaugurated. Then industries generally were depressed, while now all branches are unusually vigorous and the population [in 1892] has grown to about 70,000,000. The exhibition must be international, and directly governing this is the location of the site. Either Chicago or St. Louis would lose this feature, since 1000 miles inland would be equivalent to telling foreign exhibitors to stay at home. New York, on the sea-board, is therefore the place, since to foreign people in general it represents the United States far more fully than any town or collection of towns away from the coast does. The idea that railroad facilities would practically do away with the objection to an inland location does not hold good, since they are not known abroad. The site selected for the exposition is naturally beautiful, has a deep-water front, is easy to reach, and has already been wisely adorned. The facilities for reaching it both by water and land are unexcelled both from the interior of our own country and from Europe.

The French exposition had in all departments the advantages to be derived from experienced leadership, yet under these most favorable circumstances it took France four and one-half years to accomplish its exposition. Its construction occupied 30 months, while we now have only 29 months if our exhibition is to be opened in May, 1892. [It was here that the principal point of Mr. Towne's address concerning the international exhibition proposed to be held was made.] "This cannot be done. It is possible to hold an exhibition in New York or in Chicago or in St. Louis in 1892, and have it huge, monstrous and —discreditable." It cannot be worthy of us, especially in its artistic features. The only reason why the year 1892 has been selected is one of sentiment, which should give place to the benefits to be derived. It is the duty of the American Society of Mechanical Engineers to warn the public that this cannot be done by 1892, and that more time, at least one or two years, must be given. The American engineer should tell his countrymen that it cannot properly be held in 1892, no matter in what locality.

The third topic considered by Mr. Towne was the society. The aim of the society, the good it could accomplish if properly directed, as given by the late A. L. Holly in his few remarks made when the desirability of such an association was being discussed, have been more than fulfilled. Beginning with the 189 members, it now has 1048, is housed in commodious quarters, has a fine technical library, and more than this, an individual interest manifested by all to enhance the value of the work done by the society. The time is coming when it will be advisable, or perhaps imperative, to create a new organization, which, without interfering with any of the old ones, will include the best talent in the country. With all the success heretofore had by mechanical engineers, there is room for further improvement in the method of conducting business, in editing the reports and in making special investigations.

REPORTS.

The report of the council stated that a brief account of the foreign trip would be published and steps would be taken to extend courtesies to the British Iron and Steel Institute when they visited this country.

During the year 178 candidates had been admitted.

The spring meeting will be held in Cincinnati, May 20. The report of the tellers appointed to count ballots for officers for the ensuing year was as follows: For president, Oberlin Smith, Bridgeton, N. J.; for vice-presidents, Joel Sharp, Salem, Ohio; George W. Weeks, Clinton, Mass.; De Volson Wood, Hoboken, N. J.; for treasurer, William H. Wiley; for managers, James E. Denton, Hoboken, N. J.; Carleton W. Nason, New York, and H. H. Westinghouse, Pittsburgh, Pa.

TABLE OF THE PROPERTIES OF STEAM.

This paper is translated from the French of V. Dwelshauvers-Dery, of Liege, Belgium, honorary member of the society, the introduction being by Professor Thurston, who stated that the author had given much attention to the exchanges of heat occurring in the cylinder of the steam-engine, resulting in losses of energy of serious amounts, as illustrated by experiments of Watt, Clarke, Hirn and Isherwood. In the course of this work an exceedingly interesting and valuable method has been devised for exhibiting the processes of exchange occurring in any given case in which the data have been available by experiment, and graphical instructions have been given representing its action and its effects. He has also prepared a set of steam-tables to be used in the course of such work, and which are presented with the paper, the values being in British units and in such form as may facilitate the calculations to be made from data obtained in formal trials of the steam-engine. The text accompanying the tables embodies a succinct exposition of the theory of M. Hirn and also two examples illustrating the methods of the author.

Also appended is a plate in which is exhibited the complete graphical construction of the process and results showing the quantity of heat and of equivalent work produced, the quantity lost by the cylinder-walls and the amount of the remaining loss. The total of these several quantities measures the amount of heat and of energy supplied to the engine.

This "diagram of exchanges," as its author calls it, may also not improbably prove to be of great value to the engineer seeking to determine in advance of the construction the probable demand of a proposed engine doing a specified quantity of work. The problem of discovering the methods and the laws of wastes occurring through the interaction of the steam and the inclosing surfaces of the steam-cylinder is to-day the one important problem in the theory of the engine. This problem, attacked mathematically by Grashof and experimentally by a dozen well-known engineers, is exhibited and illustrated by the graphical work of Dwelshauvers in such manner as is likely to prove of real assistance in promoting the final complete solution.

The introduction further says that those who are interested especially in this subject can get still more complete ideas of the method and the result of its application by studying the paper by the same author recently issued by the British Institution of Civil Engineers. This method consists in the application of the processes here indicated to the computation, from the measurement of the indicator diagram, of the quantities of heat lost by the steam in the engine in the three principal directions of expenditure—namely, transformation into mechanical energy, waste by way of the metallic surfaces of the interior of the cylinder and thermo-dynamic and thermal losses in other directions. By this method it is found that the jacket does not always produce a flow of heat into the engine, a result probably suspected by every expert observer and experienced engineer, but probably never before so completely proven. This fact accounts for the diverse testimony often given respecting the action and efficiency of the jacket. The process pursued by the author enables us to divide the engine into two parts, treating the two ends of the cylinder separately and discovering through examination of the differences many facts not otherwise obtainable. A distinction not heretofore made is that of the positive and negative flow through the surfaces receiving heat and through those restoring heat. Thus the jacket may sometimes produce marked economy, while in other cases it may produce none, or may even cause loss. It may yield economy by preventing external losses, giving absolutely no heat to the steam, but simply preventing its losing as much as it otherwise would. The use of the jacket is ordinarily advantageous by preventing transfer of heat to the metal of the cylinder during admission and the function of the jacket is usually substantially completed at the close of this period, and consequently the engine of large dimension and small stroke, a given volume being demanded, and with the jacket on its heads, has ideally at least an advantage economically.

The paper, the object and aim of which is briefly summarized in the foregoing abstract from Professor Thurston's introduction, deals with the question under the following heads: Latent heat of dry saturated steam; mixture of water and saturated steam; conditions of working, which includes the data the experiments must furnish and the results obtained. The final table, with which the paper closes, is arranged under the following heads, the pressures in pounds per square inch ranging from 1 to 190: Pressure in pounds per square inch; pressure in pounds per square foot; temperature in degrees F.; volume of 1 pound of pure saturated steam in cubic feet; weight of 1 cubic foot of pure saturated steam in pounds; heat of 1 pound of saturated steam in thermal units; internal latent heat of 1 pound of pure saturated steam in thermal units; external latent heat of 1 pound of pure saturated steam in thermal units; total latent heat of 1 pound of pure saturated steam in thermal units, and total heat of 1 pound of saturated steam in thermal units.

When this paper was open for discussion Professor Thurston explained that it was written to illustrate and make known the work of M. Hirn. The paper is not to be considered as exhaustively covering the subject, but as advancing a short way, and mainly as showing the direction in which further progress could be made.

Exactly what is going on in the cylinder of a steam-engine is still unknown, and to definitely settle the question will require well-directed efforts of the highest talent. The importance of ascertaining accurately the losses is appreciated.

THE THEORY AND DESIGN OF CHIMNEYS,

by Horace B. Gale, stated that to the writer the theories of chimney draft promulgated by well-known writers and accepted by engineers seemed to contain certain errors on which have been based conclusions not supported by practical results.

It is evident that it is the excess of the external pressure over the pressure in the bottom of the chimney which causes the current of air to flow through the furnace into the chimney, and upon this quantity of air depends the quantity of fuel that can be burned. This flow will be governed by the difference in the pressures, and will be influenced by the friction of the gases against the sides of the chimney. The paper gives formulas for ascertaining this, the coefficient of friction having been determined by experiments to be 0.012 for an iron stack and 0.016 for a brick one. The paper deals with the design of chimney to do a given work, the most economical proportions, the area of maximum draft for a chimney of a given hight, velocity and temperature of maximum draft, forced draft, proportions of furnace, flues, &c., and the material and shape of chimneys. In conclusion the paper states that the formulas have been tested by comparison with the results obtained in a number of actual cases and have been fairly sustained by the facts.

This paper was rather severely handled in discussion, it being stated that the main error was the statement that the friction against the sides of the chimney should be taken out. Considering this in the way it always has been, the formula presented would agree with that generally employed. The formula given by Rankine has always been considered good enough for ordinary practice, and in a subject not requiring excessive refinement it would undoubtedly hold its own position.

Prof. R. H. Thurston presented a paper on the

PHILOSOPHY OF THE COMPOUND ENGINE.

The wastes of the steam-engine may be divided into two principal classes, the external and internal, the latter being of two distinct kinds. External wastes are those losses of heat produced by the conductivity and radiating-power of the materials of which the heated parts of the engine are composed. Internal wastes are losses of heat rejected at the lower limit of temperature and wastes by internal conduction and storage of heat. To these are added wastes of mechanical energy. Three methods have been found to be advantageous to ameliorate the wastes—superheating, steam-jacketing and compounding. The three main facts upon which to base the theory of the multi-cylinder engine are:

1. Economical expansion in a single cylinder has a limit, due to increasing internal wastes, which is found at a comparatively low ratio of expansion.

2. The method of expansion may be for practical purposes such as are here in view taken to be approximately hyperbolic, the terminal pressure being something above that which corresponds to the sum of all useless resistance, and which may be here taken as, for example, about 10 pounds per square inch above a vacuum. The division of the initial pressure by this terminal pressure will thus give an approximate measure of the desirable ratio of total expansion for the best existing engines.

3. All steam entering any one cylinder will be rejected as steam into the succeeding cylinder, external wastes being neglected, and into the condenser; and the full amount of steam condensed at entrance by absorption of heat by the interior surfaces of the cylinder will be re-evaporated later and will pass into the condenser or into the next cylinder, and the heat transferred in the one direction in the one process will be transferred in precisely equal amount in the opposite direction in the other.

The first principle shows that, a limit existing to economical expansion in a single cylinder, the advisable number of cylinders in series may probably be determined when that limit is determined by experiment, by general experience or by rational theory and computation. The second principle shows that we may find a tentative measure, at least, of the desirable total ratio of expansion for maximum density when the best terminal pressure for the chosen type of the engine is settled upon. The third principle permits an estimate to be made of the probable internal wastes of the series and the probable total expenditure of heat and steam and a solution of all problems of efficiency for the compound engine of whatever type. The first step is the determination of the best ratio of expansion considered from the stand-point of commercial efficiency. Expansion in a single cylinder may be economically taken as 2½ expansions for unjacketed engines with wet steam and 3 or 4 for the last class of engines. The total expansion ratio thus becomes for several types of multi-cylinder engines as below:

1 cyl.	2 cyl.
2.5 to 3	6.25 to 9
25 to 30 pounds.	60 to 100 pounds.
3 cyl.	**4 cyl**
16 to 27	40 to 81
120 to 300 pounds.	350 to 800 pounds.

A triple-expansion engine should do best work up to a pressure of 250 or 300 pounds; a four-cylinder engine should do best at the highest pressure likely to be adopted, while the double-expansion would serve the purpose below the lowest figure above assigned to the triple engine. Superheating at the high-pressure cylinder will produce a favorable effect all through the series, although cylinder condensation will cumulatively increase through the series. Upon the question of steam-jacketing as applied to the compound engine authorities disagree whether to jacket the high or low or all the cylinders. Assuming that, on the whole, the jacket is desirable, the last is the best.

The most modern device for reducing internal wastes is high engine speed, yet

the advantage to be derived by further increasing the present speed does not seem likely to be great. Non-conducting cylinders would do away with the necessity of compounding on the ground of thermodynamic gain, but would leave unaffected the advantages of the compound engine on the score of better division of stresses and work. What may be done in this direction it is as yet impossible to judge.

How many cylinders will it pay to introduce is the question the engineer must solve. The considerations involved are the following: It may be taken as the result of general experience in good practice that under the best customary conditions of operation a good simple engine, working at high-pressure, condensing, and at the best ratio of expansion for maximum engine efficiency, may be fairly expected to give as good a result as 2 pounds of fuel of satisfactory quality per horse-power and per hour. Under similarly favorable conditions we may obtain better work with multi-cylinder engines in somewhere about the following proportion:

Engine.	Consumption.	Gain, total.	Gain, diff.
Simple, one cylinder..	2 lbs.	..	..
Double expansion.....	1.6"	20 %	20 %
Triple expansion.....	1.4	30	10 %
Quadruple expansion.	1.25	40	10
Quintuple expansion..	1.1	45	10

The paper closes with several illustrations of approximate solutions of such problems as arise in common practice or as illustrated in the experience of the engineer seeking to ascertain which of all available designs is the best for the special purposes in view.

Considerable discussion was started on this paper, being mostly confined to the remarks on steam-jacketing. Professor Denton asked if the author would kindly add to his paper the experiments from which he drew his conclusions relating to the saving effect by the use of steam-jackets, describing in detail the full method of procedure. A subject of such importance so long attentively studied by engineers of the highest ability should be carefully considered in every phase, and all references and experiments bearing upon the subject should be given.

F. H Ball stated that he had made experiments with steam-jackets in the case of a compound engine, in which he obtained results widely different from those given in the paper. In making these tests the saving resulting from the use of steam-jackets had been materially reduced when the condensation of steam from the jacket was considered in the computation.

Professor Thurston stated that the testimony in regard to the efficiency of steam-jackets differed widely and in tests under working jackets it is extremely difficult to obtain accurate results. The cases given in the paper in regard to the ideal engine were founded on actual and best practice, which may be considered as representative up to the present time, yet were not to be considered imperative.

A joint paper by C. H. Peabody and L. H. Kunhardt was presented on the

FLOW OF STEAM THROUGH ORIFICES.

This paper may be considered as supplementary to one formerly presented by Professor Peabody on the flow of steam in a tube 0.275 inch in diameter and 8 inches long, the present paper being founded on experiments made by Mr. Kunhardt of the class of '89, Massachusetts Institute of Technology. The orifices by means of which the present experiments were made were each $\frac{1}{4}$ inch in diameter, were well rounded to prevent contraction at the entrance and were straight at the lower end for the distances of $\frac{1}{4}$, $\frac{1}{2}$ and $1\frac{1}{2}$ inches. The side orifice through which the pressure was taken was $\frac{1}{32}$ inch in diameter and was drilled at the middle of the straight part. When in place the orifice was screwed into a brass plate between two cast-iron reservoirs 6 inches in diameter and 2 feet long and had a brass pipe leading from the side orifice, through the second or low-pressure reservoir, to a pressure-gauge at a convenient position. The brass tube was deflected to one side so as not to interfere with the jet from the orifice, and the lower side only of the brass plate was covered with asbestos to check the flow of heat. The whole apparatus was covered with asbestos and hair-felt and jacketed with Russian iron; the loss of heat by radiation was less than the probable errors of observation. Two distinct series of tests were made—one showing the relation of the three pressures in the first and second chambers and at the side orifice and one showing the amount of steam flowing through the orifice per hour. The results obtained are tabulated in the paper, in four groups. An examination of these groups shows that in each the pressure at the side orifice is affected but little by change of pressure in the second chamber till the absolute pressure in that chamber approaches half that in the first chamber, when the pressure at the side orifice slowly increases; but when the lower pressure becomes more than half the upper pressure the pressure at the side orifice increases markedly. The second table gives the flow of steam during tests of 20 and 30 minutes.

A paper entitled

AN EXPERIMENTAL STUDY OF THE ERRORS OF DIFFERENT TYPES OF CALORIMETERS

was presented by C. H. Peabody and A. L. Williston. The paper is founded on experiments made by the latter on calorimeters for determining the moisture in steam. Four forms were used—a throttling-calorimeter, designed by the writer, a Barrus continuous water-calorimeter, a Hoadley and a barrel-calorimeter. The paper briefly describes the several forms and gives in tabulated form the results of extended tests.

L. S. Randolph presented a paper on the

COST OF LUBRICATING CAR-JOURNALS.

In studying the subject of the lubrication of car-journals the writer was led to the conclusion that the usual lubricating tests of co-efficients of friction, durability, &c., were unreliable, as they did not pretend to reproduce the conditions of actual practice, giving neither the wear on the journal—which is more important than the co-efficient of friction—nor the action when the journal was flooded with the lubricant, the condition which it obtains in good practice. The method is explained by describing a test recently made on a baggage-car truck, the load on the journal being about 5000 pounds. The oil used as a standard, and which was taken as unity, was an ordinary straight reduced petroleum. To ascertain the value of the lubricant as compared with the standard oil the cost of the brass per ounce wear and of the journal per $\frac{1}{64}$ inch wear are added together and multiplied by the mileage. This, divided by the same data obtained from the standard, will give the relative value of the lubricants. In ascertaining the cost of the metal account is taken of the value of the scrap. As a rule the amount of lubricant is not regarded, since the difficulties in the way of regulating the amount would vitiate the results to such an extent as to make them practically worthless. When the co-efficient of friction can be obtained with any degree of accuracy it is well to take into account the relative amounts of coal consumed.

Professor Denton considered the method described in the foregoing paper of lubricating journals a decided advance on the method of testing oil, since the great cost results in metallic wear of both the journal and brass, and not in the cost of the lubricant used. This is evident, since in the former case we have not only a direct waste but we also have a waste which finally tends to complete destruction. The cooling compounds sometimes employed are in general a mixture of grease with talc, sulphur or bituminous coal. Although the employment of these wears the journal out more than oil, the cooling effect is there the same as if the surface of the journal had been sand-papered. Their cooling action on rough journals which have heated is explained by the fact that a solid employed with grease acts to grind the journal back to its true surface. The metallic wear in brass and journal is decidedly greater than the cost of oil for lubrication or the power to overcome friction. It was stated by a member that he knew of a case in which all the oil was removed from a hot journal, the box was filled with sand, then run for a few miles, when the sand was cleaned out and oil replaced. The action in this case was similar to that of the cooling compounds, inasmuch as the sand reduced the rough surface to a smooth surface. In making tests great care should be exercised and the condition of the bearing ought to be well known.

The paper by E. F. C. Davis, on "Steam Pipes for Collieries," and that by D. K. Nicholson, of "Rolling Steel Rails," we shall publish in full.

The paper by C. J. H. Woodbury on

METHODS OF REDUCING FIRE LOSS

may be divided into three parts—supervision, construction and fire apparatus. In a manufactory valuable results may be obtained by an inspection of the whole property made on Saturday afternoon by two men, such as foremen or overseers of rooms, who may be appointed to serve four weeks, their assignment terminating on alternate fortnights.

The method of mill-building known as slow-burning construction combines the advantages of low initial cost and great resistance to destruction by fire, the final result being that the manufacturing is housed at the minimum annual cost. The fundamental principle of such construction is to mass the material in such a way that there shall not be any concealed spaces about the structure and that the number of projections of timbers, which are more easily ignited than the flat surfaces, shall be reduced as far as possible; that iron portions of the structure shall not be exposed to the heat of any fire in the contents of the building; and furthermore, that the isolation of the various portions, both in respect to that of one building to another and of the various rooms and stories of the same building, shall be as complete as is feasible.

The best form of fire-door is that made of two thicknesses of matched boards, placed at right angles to each other and nailed together, being covered on the outside by tin securely locked together and held to the door by numerous hanging strips. The door should be secured to the hangers by means of bolts and not screws, and the rail upon which it runs strongly bolted to the wall. When closed such a door should fit into a jamb and be securely held in this manner against the wall. Such doors are frequently hung upon an inclined track, and by some application of highly-fusible solder at the

catch are so arranged that they will be closed by the heat of a fire if not closed by hand.

The practical results of private fire organizations, where fire has occurred, have been very marked; and systematic and skillful work has been the rule, in place of the needless confusion and liability to breakage of the apparatus which almost inevitably occurs in the lack of such organization.

Buckets of water are the most effective fire apparatus. Automatic sprinklers have proved to be a most valuable form of fire apparatus in operating with great efficiency at fires where their action was unaided by other fire apparatus, particularly at night. Although automatic sprinklers have proved to be so reliable and effective, yet, in order to provide for all possible contingencies, their introduction should not displace other forms of fire apparatus, particularly stand-pipes in the stair-way towers, with hydrants at each story. Fire-pumps are generally too small for the work required of them, 500 gallons per minute being the minimum capacity recommended.

In the discussion of this paper several interesting points were brought out concerning fire protection. It was stated that in one case when automatic sprinklers had begun their operation on a fire which had been reduced to a smoldering condition and would be completely extinguished in a short time, the water department of the town appeared, attached their apparatus to the same pipe which supplied the sprinklers, and taking all water from the latter the fire again started up and the building burned down. President Towne stated that in his experience he had once had a fire caused by spontaneous combustion in the paint-shop which was spread by the employment of too much water, upon which the burning oils were floated to other parts of the works. He described a paint-shop made with a pit some two or three feet below the surface of the ground. In case a fire started in the shop the oil is confined to the pit and the spread of the fire is prevented.

Another instance was given in which japan receptacles were inclosed in a chimney, the lower part of which was closed with a side door, while the top of the chimney was provided with a cover in order to keep out the rain. A string extended across the receptacle and was attached to the lower door and also to the top cover. In case of a fire the string burned, closed the lower door and opened the upper door, which was suitably weighted, thereby carrying an upward draft and confining the fire to the interior of the chimney.

Tuesday evening some 200 of the members and guests of the society assembled at the annual dinner and spent many pleasant hours together, The president, after a brief introductory address, introduced Professor Thurston, who considered the question "Our Foreign Relations." The next toast was responded to by W. Kent. Other addresses were made by C. Kirchhoff, Jr., R. W. Hunt, C. Harris, W. E. Partridge and Professor Hutton.

On Wednesday the members visited in a body the Government Station at Willett's Point and the Central Forge Works, at Whitestone, and in the evening attended a reception by the Engineers' Club.

The coal-barge R. A. Fisher, at Staten Island, was once the famous clipper Agnes Rose, driven out of the China tea trade by tramp steamers

PERSONAL.

A. F. Keating, of Zug & Co., Limited, proprietors of the Sable Iron and Nail Works at Pittsburgh, has been appointed to represent that city on the World's Fair Committee.

Charles E. Coffin, of Muirkirk Furnace, Muirkirk, Md., has been elected to the State Senate to represent Prince George's County.

S. B. Lowe, the Chattanooga representative of *The Iron Age*, has been in New York during the past week.

C. P. Beddow has resigned the superintendency of the Etna Coal Company to accept the position of general manager of the Alabama Connellsville Coal and Coke Company, at Birmingham, Ala.

Dr. Gustave I. Bidtel has opened a chemical laboratory at Chattanooga, having resigned his position as chemist of the Walker Iron and Coal Company, at Rising Fawn, Tenn.

John S. Kennedy, recently at Roanoke, Va., has been appointed superintendent of the Everett Furnace, at Everett, Pa., which is to be blown in next month under the management of Joseph E. Thropp, of Philadelphia.

Robert G. Leckie, of Sherbrooke, Canada, will on the 1st of December assume the management of the iron-works at Londonderry, Nova Scotia.

A. J. Leith, president of the Illinois Steel Company, has recently returned from Europe.

P. D. Langdon has recently been elected president of the Alabama Ore and Railroad Company, with headquarters at Tecumseh, Ala. He has organized the Langdon Iron Company, with R. P. Sibley, of Augusta, Ga., who formerly ran the Round Mountian Furnace, as president. The 40-ton charcoal furnace is expected to be in blast by the 1st of February.

Walter Graham, who was formerly at Bellefonte, Pa., has accepted the position of manager of the Graham Furnace Company, at Graham, Tazewell County, Va.

It is privately announced that a change of commandants at the Rock Island National Armory and Arsenal is soon to take place. Col. Thomas G. Baylor, who has been in command since June, 1886, is to be transferred to the Frankford Arsenal, near Philadelphia. The new commandant at the Rock Island Arsenal is Col. James M. Whittemore. The Rock Island Arsenal is an important manufacturing establishment.

Our Pittsburgh correspondent telegraphs that J. H. Flagler, general manager of the National Tube Works Company, at McKeesport, Pa., has resigned. E. C. Converse, until now assistant general manager, has been appointed his successor.

OBITUARY.

JOHN H. SHOENBERGER.

John H. Shoenberger, one of the pioneer iron manufacturers of Pittsburgh, died at his residence, at 43 West Fifty-seventh street, New York City, on the morning of the 12th inst., of paralysis. Mr. Shoenberger was born in Huntingdon County, Pa., in 1809, and went to Pittsburgh with his father, Dr. Peter Shoenberger, in 1826. The latter was among the first to develop the iron industries of the Juniata Valley, and early in this century his iron was hauled in wagons across the Alleghany Mountains to the head waters of the Conemaugh and there loaded on flatboats, which conveyed it by the Kiskiminetas and Allegheny rivers to Pittsburgh. At his death he left each of his ten children an iron furnace. John H. Shoenberger, who by reason of his father's interest made frequent trips to Pittsburgh, at last concluded to locate there, and the Shoenberger nail mill was established in that city 50 years ago. After the death of his father in 1858 he took the active management of the business of J. H. & G. H. Shoenberger. Such had been the title for 26 years, the founder, Dr. Peter Shoenberger, having retired in 1832. In 1860 the firm became Shoenberger, Blair & Co., and in 1865 Gen. C. L. Fitzhugh, George Shoenberger, of Cincinnati; John Z. Speer and G. A. Steiner leased the mill and still operate it, though John H. Shoenberger always retained an interest.

WILLIAM MULLEN.

William Mullen, for some years secretary of the Coke Workers' Union, whose home was in Scottdale, Pa., died at the Mercy Hospital, Pittsburgh, on the 10th inst., of consumption. He was one of the leaders in the great coke strike of 1886 and was identified with all labor movements in the coke region. He was born in Durham, England, and was 34 years old.

Heat-Energy Into Motive Power.

A recent invention describes a novel method of transforming the potential energy of heat into motive power, whereby the energy, stored in the ordinary form of fuel, may be utilized under conditions of high efficiency. It is well known that if air at atmospheric pressure be heated its pressure will be increased, the rapidity of the increase being in proportion to the speed in the rise in temperature. If the air be first compressed and then heated, there will be not only a remarkable gain in pressure, but a large relative economy in the heat needed to raise the temperature. If the heated air be cooled it will lose the pressure due to its formed high temperature, the rapidity of decrease being in direct ratio with the speed of the fall of temperature. Air is heated very readily by contact with a hot body of some kind, scarcely at all by radiation and only very slowly by conduction. Consequently the heating of a body of air reaches its maximum rapidity when its every molecule is in contact with a hot body. It is evident that the more minutely the heating or cooling body is divided the greater will be its heating or cooling surface, and the surface presented by the molecules of water in a state of vapor may be said to be infinitely greater than the surface of the same quantity of water as a liquid.

The invention of J. J. McTighe, of Pittsburgh, claims to utilize in a practical way these well-known principles. In one end of an ordinary cylinder provided with the usual piston is air under a pressure of 300 pounds, while in the other end is air having a pressure of 150 pounds. Into that end of the cylinder having an air-pressure of 300 pounds is sprayed water having a temperature of 350°, while cold water is sprayed into the opposite end. The pressure behind the piston is instantly raised to, say, 370 pounds per square inch when the piston moves forward. The reverse takes place to produce the return stroke. It is claimed that economy is thus secured by the small amount of fuel required to heat the water through a differential temperature of only 35°, and by the small amount of running water around the cooler required to abstract the small amount of heat imparted to the cold spray by the hot air and vapor. The hot water returns to the heater without having lost much of its heat.

The main office of the Standard Oil Fuel Burner Company has been removed to the factory of the company, at Fort Plain, N. Y.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, November 18, 1889.

Pig-Iron.—The exciting reports in circulation here from Southern Iron centers are having a decided effect on sellers of Coke Irons. The demand for such iron has been improving in the past few days, and negotiations were progressing for round lots for future delivery, but furnace companies have withdrawn in all such cases and only small quantities are now to be had. Those manufacturers who were disposed to sell for future delivery at current prices, hoping to prevent inflated values, have become convinced that it is useless for them to attempt to stay the tide and they are now inclined to go along with it. Higher prices therefore seem to be inevitable. Strong and Soft Foundry and Bessemer Irons are all in good demand. Small lots of Bessemer were sold at Mahoning Valley furnaces last week at $21, but prices here are not yet on a parity, as $22 is asked by Chicago makers. Local Coke Irons are quoted at $19, $18 and $17, cash, for Nos. 1, 2 and 3, with a limited quantity probably available at $18 for No. 1. Southern Coke can be had in small lots at $18.50 @ $19, cash, Chicago, for No. 1 and corresponding prices for lower grades, except Gray Forge, which is not to be had at any price. Jackson Country and other Southern Ohio furnaces are asking about 50¢ ℔ ton more than last week and making sales, although freight rates have not been advanced in accordance with the announcement made by the railroad companies. Charcoal Irons continue sluggish, and there are still enough sellers of Lake Superior Charcoal at $20 to prevent the upward movement which has so long been expected in this branch. Tennessee Charcoal has been sold at an advance of 50¢ ℔ ton the past week, but is still to be had cheaper than Lake Superior. Alabama Car-Wheel is unchanged at $24.25 @ $25.25, cash, Chicago.

Bar-Iron.—Car specifications have been slightly advanced since our last report, and 1.90¢, flat, Chicago, now appears to be the bottom rate. Considerable business was done in this line during the week and still more is in sight. The usual quotation for ordinary specifications of Common Iron is 1.90¢, half-rates, Chicago, but the demand is light from general consumers, whose wants seem to be supplied for the present. The advance just made in freight rates from Eastern points will very probably be added to mill prices in that section, making Mahoning Valley Bar-Iron cost from 1.90¢ to 1.95¢, laid down in Chicago. Railroads are coming in the market, however, asking bids on Iron for delivery early in 1890, and the volume of business from that source promises to be large. Jobbers are doing a fair business and continue to quote 2.1¢ @ 2.2¢, from stock, according to quantity.

Structural Iron.—While orders are light for new business, heavy deliveries are being made on old contracts. Many projects are coming forward for next season, including a great deal of bridge-work, and the prospects are excellent for the new year in this branch of trade. Quotations are unchanged.

Plates, Tubes, &c.—Manufacturers' agents and dealers agree in reporting a continued good demand with prices very firm. Carload lots are quoted as follows, f.o.b. Chicago: Nos. 10 to 14 Iron Sheets, 2.70¢; Steel do., 2.85¢; Tank Iron, 2.60c; Tank Steel, 2.75¢; Small lots from store are quoted as follows: Iron Sheets, Nos. 10 to 14, 2.90¢ @ 3¢; Steel do., 3¢ @ 3.10¢; Tank Iron, 2.70¢; Tank Steel, 2.85¢ @ 2.95¢; Shell Steel, 3¢ @ 3.10¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 50 % off for 1¼-inch and less and 55 % off for 2-inch and upward.

Sheet-Iron.—Jobbers report such a heavy consumpton of Black Sheet in progress that they have no trouble in getting 3.50¢ for No. 27. Mill lots sell at 3.15¢, at mill, for No. 27 for forward delivery. Galvanized Iron continues to move very freely, and jobbers have marked prices for small lots up to 50 and 10 % off, while manufacturers' agents quote 60 % and 62½ % off to heavy buyers.

Merchant Steel.—Open-Hearth Steel constantly grows firmer, but Crucible Steel shows no change except in Railway Spring Steel which promises to approximate Tool Steel shortly. Carload lots are quoted as follows, f.o.b. Chicago: Spring Steel, 2.60¢; Tire Steel, 2.40¢ @ 2.50¢; Toe Calk, 2.50¢ @ 2.60¢; Open-Hearth Machinery, 2.50¢ @ 2.75¢; Bessemer Machinery, 2.25¢ @ 2.35¢; Solid Cast Plow Steel, 3.50¢; Open-Hearth Plow Steel, 3¢. From store jobbers quote: Mild Machinery, 2 30¢ @ 2.50¢; Bessemer Machinery, 2.40¢ @ 2.60¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Tire, 2.50¢ @ 2.60¢; Tool, 7.50¢ upward; Sheet, 7¢ @ 10¢.

Steel Rails.—Sales agents report the transactions of the past week confined to small lots, with but few inquiries received for round lots to be delivered next year. They quote $35 for next year's business of any character, and $37 @ $37.50 for small quantities for prompt shipment.

Track Supplies.—Business is somewhat quiet at present. The railroad companies who have contracted for their next year's supplies of Rails appear to have adopted quite generally a policy of waiting for developments before purchasing the necessary fastenings. They may or may not commit an error of judgment in this respect, but manufacturers of fastenings incline to the former opinion, believing that prices will be much higher in the future. Quotations are as follows, Chicago: Soft Steel Splice-Bars, 2.25¢ @ 2.50¢; Iron do., 2¢ @ 2.05¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.85¢ @ 2.90¢; Hexagon do., 2.95¢ @ 3¢.

Old Rails and Wheels.—Old Iron Rails are quotable at $26 @ $26.25 on the basis of recent transactions. Railroads continue to offer them in limited quantities, keeping the supply low. Old Steel Rails bring $19.50 @ $20, and are in good demand. Old Car-Wheels are quiet, with $19 @ $19.50 representing the views of buyers and sellers.

Scrap.—The week has been rather quiet in this line, as consumers are well stocked. An exception is noted in the case of Mixed Steel, which is being picked up in large quantities by local consumers as well as by Pittsburgh parties. Mill Scrap is scarce and dearer, as will be seen by our quotations. Dealers' selling prices are as follows, ℔ ton of 2000 lb: No. 1 Forge, $21.50 @ 22; No. 1 Mill, $17.50 @ $18; No. 2 Mill, $12; Car-Axles, $26; Fish-Plates, $23.25; Horseshoes, $21; Pipes and Flues, $16.50; Cast Machinery, $13.50 @ $14; Stove-Plates, $11; Cast Borings, $8.50; Wrought Turnings, $13.50; Axle Turnings, $14.50; Coil and Leaf Steel, $18.50; Tires, $19; Mixed Steel, $15.50; Mixed Country Scrap, $17.50.

Hardware.—Trade in Shelf Hardware is reported as active as ever by local jobbers. Bills continue to cover all classes of goods. Not only is the general stock moving, but an inclination is noticed among retailers to order such goods for spring trade as they can purchase now, showing their faith in a higher range of prices next year. These orders cover such merchandise as Wire-Cloth, Steel Farm and Garden Tools, &c.

Nails.—On account of the advance in freight rates which goes into effect to-day it is proposed to change the price of Cut Steel Nails to $2.50 for small lots from stock. Wire Nails will then be marked up to $3.25 to preserve the proper difference between the two classes of Nails. Factory prices are maintained at $2.25 for Steel Nails and $3 for Wire Nails, at mill, for good specifications. Agents report a continued good demand, with few mills now able to take any orders for delivery before January 1, their present limit of sales.

Barb-Wire.—Jobbers are still quoting Painted at 3.25¢ for small lots and 3.15¢ for carload lots, with Galvanized maintaining its usual advance of 60¢ ℔ 100 lb. The operations of the Federal Steel Company are attracting much interest, but buyers evidently do not anticipate much higher prices on that account, or they would purchase more heavily for their future requirements.

Pig-Lead.—The transactions of the past week have been confined to carload lots, prices declining from 3.70¢ at the beginning of the week to 3.65¢ at the close. Buyers are bearish in their views and not inclined to bid over 3.60¢. A light demand is expected for the next few weeks, although Lead now seems very cheap in the estimation of those who are well posted in the trade.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., November 19, 1889.

Pig-Iron.—Considering the comprehensive treatment furnished by *The Iron Age* from its various offices and in its editorial columns in regard to this department of the Iron trade, it is no easy matter to avoid repetitions. And there is certainly nothing new to be said at this time. The conditions are just the same as they were a week ago, although the feeling is perceptibly stronger. Iron is just as scarce as it was at that time, the demand just as urgent. But as we said last week, there is no real scarcity of Iron, although there is a scarcity at the prices and on the conditions which buyers are prepared to offer. Sellers show that they are not anxious to advance prices or they would have done so before now, and doubtless could have sold a good deal of Iron at their own prices. Their position is virtually this: "We have sold all the Iron we can make this year, a few contracts run further than that. This Iron goes direct to consumers, so that we know they are getting all the Irom they need. In about two weeks we will be ready to determine what should be a fair price for an extension of these contracts, and until then we are out of the market." This is in effect the position assumed by parties handling at least three-fourths of the Iron coming into this market, others doing a kind of go-as-you-please business, make quotations to suit themselves, which for really good brands have usually been at advancing prices, such for instance as $19 @ $19.50, delivered for No. 1, and $17 @ $17.50 for Gray Forge. There are instance, however, in which $16.50 and $18.50 have been accepted, while some quote still lower figures, but have nothing to sell. Until some of the larger companies define their position by naming prices at which they will accept orders, the market is likely to be very narrow and prices irregular. There is nothing in the present outlook to indicate any great change in prices, although it is extremely probable that they will limit their dates for delivery. Unless

something unforeseen occurs in them eantime we should be inclined to expect $17, $18 and $19 as fair average prices for January deliveries, 50¢ less perhaps for new brands or those not fully up to the standard, and 50¢ to $1 more for those of a specially good reputation. But in times like these it is not advisable to be sure of anything, although taking the conservative feeling that prevails among sellers as a protection on the one hand and the certainty of a heavy demand on the other, there is no apparent reason for much deviation from the figures above named.

Foreign Iron.—There are buyers of 20 % Spiegel at $34, c.i.f., duty paid, against $35 asked for prompt shipments. Ferromanganese is $85 asked for 70 %. No 80 % on the market at present.

Blooms.—There is no change from last week and very few Steel Slabs or Billets for sale, as the mills have their entire capacity engaged for some time to come. Once in a while an order can be squeezed in between times at about the following quotations: $35 @ $36, delivered, for Nail Slabs; $36 @ $37 for Sheet or Tank; $39 @ $40 for Shell; $42 @ $44 for Flange, and $43 @ $45 for Fire-Box; Charcoal Blooms, $52 @ $54; Runout Anthracite, $42.50 @ $43.50; Scrap Blooms, $32.50 @ $33.50 ℔ "Bloom" ton of 2464 lb

Muck-Bars.—The feeling is stronger, and $30, at mill, is the usual asking price. Sales during the week were made at from $29.50 to $30, and possibly some stock might yet be found at less than $30, but that appears to be a firm quotation to-day for good-quality Bars.

Bar-Iron.—The position is much the same as on date of our last report. There is plenty of business to be had at about 1.95¢ for carload lots, but those making a first-class article are firm at 2¢. Country mills appear to be well supplied with orders, as they are hardly mentioned as competitors for city trade, so that the feeling, without being particularly buoyant, is undoubtedly steady and firm. A great many car orders are said to be coming on the market again in a little while, but apart from that there is a steady run of orders from all sorts and conditions of men. Skelp is still a little quiet, but there are inquiries for several thousand tons for the first quarter of 1890, for which 1.85¢ is bid and 1.90¢ asked.

Plates.—The demand is fully maintained, and mills are taxed to their fullest capacity to meet deliveries as required. Orders are on the market for large lots Bridge-Plate, Ship-Plate, Tank-Plate, and in fact Plates of every description are in demand. Slightly higher prices are required, and it is not unlikely that our quotations will require a further revision before another week comes around. Meanwhile sales have been made chiefly at prices as follows: 2.30¢ @ 2.35¢, delivered, for Ordinary Iron Plates and Tank-Plates; 2.40¢ @ 2.45¢ for Universal Plates; Shell, 2.6¢ @ 2.7¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.50¢ @ 2.60¢; Shell, 2.75¢ @ 2.8¢; Flange, 3.1¢ @ 3.15¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—There is a continued heavy demand for everything in the way of Shapes. Mills are full of work for weeks to come, while new business is constantly looming up for the near future. Under these conditions firm prices go without saying, the main difficulty being to place orders with those who can guarantee satisfactory deliveries. Prices are usually quoted about as follows: Bridge Plate, delivered, 2.35¢ @ 2.40¢; Angles, 2.30¢ @ 2.35¢; Tees, 2.7¢ @ 2.8¢; Beams and Channels, Iron or Steel, 3.1¢; Steel Plates and Angles range from 20¢ to 30¢ higher than the same in Iron.

Sheet-Iron.—There is a good demand at firm prices. In some cases slight advances are asked, as the mills are very much crowded with orders, but carload lots can still be had at about last week's prices,

Best Refined, Nos. 14 to 20	3.10¢
Best Refined, Nos. 21 to 24	3.30¢
Best Refined, Nos. 25 to 26	3.50¢
Best Refined, No. 27	3.60¢
Best Refined No. 28	3.70¢

Common, ¼¢ less than the above.

Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3¾¢
Best Soft Steel, Nos. 25 to 26	3⅞¢
Best Soft Steel, No. 27	4⅛¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	62½ %
Common, discount	65 %

Steel Rails.—There is not much demand for Rails at the prices now asked, but mills have so much work on hand that there is no urgency on the part of sellers. Prices are $35 at mill for all deliveries, and from present appearances there is no probability of lower figures for a long time to come. Sales of several lots during the week, all $35 at mill or its equivalent.

Old Rails.—There are so few Rails at the sea-board that practically there is no market. There are buyers at $26 @ $26.50, but the only actual sales were for deliveries at mills near-by, for which $27 @ $27.50 was realized, which are fair average prices at this writing.

Scrap-Iron.—There is a good demand and prices show a steady upward tendency. Sales at about the following prices: No. 1, $23.50 @ $24 for carload lots, delivered; or for choice, $25; No. 2 do., $17 @ $18; Turnings, $15 @ $16; Old Steel Rails, $20 @ $22; Cast Scrap, $15 @ $16.50; do. Borings, $10 @ $11; Old Fish-Plates, $27 @ $28.

Nails.—There is no material change from last week. Prices are steady at $2.10 for carload lots of Iron Nails and $2.20 from store. Steel Nails are held at 20¢ @ 30¢ above the price for Iron, but buyers do not feel inclined to pay so large a difference, hence there is a heavier run on Iron Nails.

Wrought-Iron Pipe.—There is a good demand, but no change in prices. Discounts as follows: Butt-Welded Black, 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. }
CINCINNATI, November 18, 1889. }

Pig-Iron.—Strength is the one feature above all others in the local market for Pig-Iron. Prices have advanced during the week from 75¢ to $1 ℔ ton, but the volume of business has been of very moderate proportions. There has been no lack of demand, however, it being the attitude or inability of the furnaces which has prevented the consummation of not a few liberal transactions. Notwithstanding the strength of the market, accompanied by much higher prices, there has been an absence of excitement peculiar to such times as the present; producers and consumers are well equipped and not surprised by the course of the market. Many contracts have been well covered, relieving the urgency of buyers; still there are not a few more which would afford considerable business if the opportunity were offered to buy the Iron. There are very few Southern furnaces which have not sold full capacity for the remainder of the year, and a number have considerable Iron on hand which, already sold, cannot be shipped for lack of cars to carry the stock. Under such circumstances, and a strong tendency toward further appreciation, there is no desire on the part of producers to sell for the deliveries being inquired for, which embrace the various months from January to June. Contrary to reports and general expectations, information is received that stocks at all furnaces (North and South) show a decrease for October. Local agents have been very thoroughly tested during the past few days as to their ability and capacity to supply Iron. It is found that the entire amount available of both speculative and furnace Iron for several months is between 6000 and 7000 tons, in moderate amounts, but holders refuse to give an option, and will sell only subject to prior sale. There have been moderate sales of No. 1 Southern Coke Foundry at $18.25, No. 3 do. at $17 @ $17.25 and Gray Forge at $16 @ $16.50. There has been less demand for Car-Wheel Iron. An order has just been received for 6000 tons No. 3 Foundry, No. 1 Soft and Gray Forge, each at $17, for delivery from January to June, but not filled. The cablegrams concerning the collapse in prices of Scotch Iron were not without some moral influence here, but the recent recovery in Glasgow has fully restored, if not increased, confidence here. The speculative movements still in progress at Birmingham, Ala., are noted here, but the reports are received with a certain discount which always attends such upheavals. The current prices here at the close, cash, f.o.b., are as follows:

Foundry.		
Southern Coke, No. 1	$18.00 @	. ..
Southern Coke, No. 2	17.50 @	.....
Southern Coke, No. 3	17.00 @	....
Ohio Soft Stone Coal, No. 1	18.00 @	. ...
Ohio Soft Stone Coal, No. 2	17.00 @	.....
Mahoning and Shenango Valley	17.00 @	.....
Hanging Rock Charcoal, No. 1	20.00 @	$22.00
Hanging Rock Charcoal, No. 2	19.50 @	21.50
Tennessee and Alabama Charcoal, No. 1	18.50 @	19.00
Tennessee and Alabama Charcoal, No. 2	17.00 @	18.00
Forge.		
Gray Forge	16.50 @	.....
Mottled Neutral Coke	15.75 @	.....
Car-Wheel and Malleable Irons.		
Southern Car-Wheel	24.00 @	24.50
Hanging Rock, Cold Blast	22.00 @	25.00
Lake Superior Car-Wheel and Malleable	21.25 @	21.50

Manufactured Iron.—The rapid advance of Pig-Iron is difficult to keep pace with, and the mills are overflowing with orders. Prices are higher and still advancing.

Nails—Are strong and higher and sell well. Iron and Steel Nails, 12d to 40d, sell at $2.45 @ $2.50 ℔ keg, with 10¢ rebate in carload lots, at the mills. Steel Wire Nails sell at $3.20 @ $3.25 for 60d.

Old Material.—There have been sales of Old Rails on the C., H. & D. at $27.25, cash, with buyers at this price for more. An advance of 50¢ ℔ ton is now asked over previously current prices on other roads, with a fair inquiry. Old Wheels are wanted at $19, cash, but are held higher.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., }
ST. LOUIS, November 18, 1889. }

Pig-Iron.—The market is in a peculiar condition, and it is hard to satisfactorily explain it. To begin with, there is absolutely no Iron being bought, for the reason that there are no prices, as furnaces appear to be all at sea in regard to values. As mentioned in my telegraphic report of last Wednesday, rumors reached us that speculators are in the market and have purchased between 20,000 and 30,000 tons during the past week. We have been unable to verify this rumor, notwithstanding diligent inquiry, and merely give the facts as we hear them. Buyers are temporarily out of the market, as the prices reported from the Southern furnaces for delivery here would cause prices to be advanced from $1 to $2 ℔ ton, and buyers are not disposed to pay any such figures, at least

not at present. Whether or not prices will find their level in the course of the next week is hard to say, but it is probable that consumers will hold off from buying until the last extremity, and then only in such lots as are absolutely necessary. It will be readily seen that the market is not in a very enviable condition, and as foundry men are all filled with orders and their stock on hand, except in a few instances, is very light, it is only a question of a short time when they will again be in the market, and then, and not till then, can any judgment be passed as to the future. Under the circumstances prices are purely nominal, and we quote herewith the figures that sellers are quoting, which, it is only just to add, buyers refuse to pay, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	....	@	$19.00
Southern Coke, No. 2 Foundry,	...	@	18.50
Southern Coke, No. 3 Foundry,	....	@	18.00
Gray Forge	.....	@	17.50
Ohio Softeners	$19.00	@	19.50
Lake Superior Charcoal	22.00	@	23.00
Missouri.			
Charcoal Foundry, No. 1	18.50	@	19.00
Charcoal Foundry, No. 2	17.50	@	18.00
Tennessee.			
Charcoal Foundry, No. 1	18.50	@	19.00
Charcoal Foundry, No. 2	17.50	@	18.00

Connellsville Coke, f.o.b. East St. Louis, $5.25; St. Louis, $5.40.

Bar-Iron.—Jobbers report an active trade and mills are all busy, so much so it is doubtful if a large order could be placed at anything like immediate delivery. Prices are firm and are being strictly adhhered to, as follows: Small lots from store, 2.10¢; carload lots from mill at 1.92½¢, delivered at East St. Louis.

Barb-Wire.—The demand is holding up very well and prices are fajrly satisfactory. A leading jobber has offered several lots of Barb-Wire at low prices, but the mills refuse to meet this competition, as the Wire is believed to be old stock that was bought at a sacrifice and cannot be put into competition with fresh stock. We quote as follows, f.o.b. St. Louis, terms 60 days, or 2 % discount for cash ten days: Painted, 3.20¢ @ 3.25¢; Galvanized, 3.80¢ @ 3.85¢; carload lots, 10¢ ℔ 100 lb less than above prices.

Naylor & Co., New York, agents for the Tennessee Coal, Iron and Railroad Company, will open an office in this city on December 1. H. L. Williams has been appointed manager, and will assume control on the above date. All trade west of the Mississippi will be handled by the St. Louis office.

Louisville.

LOUISVILLE, KY., November 18, 1889.

The market the first part of the week was rather quiet, but toward the close became very active and heavy buying took place, lots of 5000 and 10,000 tons being sold for delivery extending through 12 months of next year. There has been a disposition on the part of more furnaces to sell for long deliveries than has been noted in the past, and many consider it advisable to sell a certain proportion of their Iron for at least six months. Prices show a tendency to advance, and the figures at which Iron was sold were higher than have been reported at any time before.

Southern Coke, No. 1 Foundry (new classification)	$17.75	@	$18.25
Southern Coke, No. 2 Foundry (new classification)	17.25	@	17.75
Southern Coke, No. 3 Foundry (new classification)	16.75	@	17.25
Gray Forge	16.25	@	16.75
White and Mottled, different grades	15.00	@	16.00
Silver Gray, different grades,	15.75	@	16.75
Southern Charcoal, No. 1 Foundry	18.00	@	19.00
Southern Charcoal, No. 1 Mill	16.50	@	17.00
Southern Car-Wheel, standard brands	23.00	@	24.00
Southern Car-Wheel, other brands	18.75	@	21.25
Hanging Rock Coke, No. 1 Foundry	18.00	@	18.50
Hanging Rock Charcoal, No. 1 Foundry	21.50	@	22.00
Hanging Rock, Cold Blast	23.50	@	25.50

Hall Bros. & Co., Louisville, Ky., have been appointed sole agents in all markets for the Cherokee Iron, of Cedartown, Ga.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, November 18, 1889.

Pig-Iron.—The market has shown but little change since our last report. Prices continue upon an average about the same. Speculation has not appeared quite as active as it did some three or four weeks ago, and there appears to be a more conservative feeling all around. At the same time higher prices are anticipated toward the close of the present year, and it is thought that quite lively purchasing will take place after the 1st. An item of some interest has developed within the past week or two by parties purchasing small lots and allowing the Iron to remain at the furnaces This is being done outside of the warehousing system. In this way a considerable amount of Iron has been absorbed by parties who evidently have only small amounts to invest. Some of this has been done by consumers and some by parties who evidently invest for speculation. Great inconvenience has been developed by the scarcity of cars. This, together with the probable still further advance in freights, has caused a little irregular feeling in prices.

Detroit.

WILLIAM F. JARVIS & Co., under date of November 18, say: While the volume of business has been somewhat less for the past week than a few previous weeks, yet the market remains strong, and it is hard to find a furnace man who is willing to sell for delivery after January 1. This is the case even where an advance is offered over present rates. The feeling seems to be general among all sellers that prices will advance still further early in the year, and they are therefore refusing to book orders ahead. Notwithstanding the very large production at this time, stocks do not accumulate, and the outlook certainly favors the manufacturer of almost any grade of Pig-Iron. With a quiet but firm market we quote as follows:

Lake Superior Charcoal, all numbers	$21.00	@	$21.50
Lake Superior Charcoal Bessemer	21.00	@	22.00
Lake Superior Coke Bessemer	22.50	@	22.75
Lake Superior Coke Foundry, all ore	20.00	@	21.00
Lake Superior Coke, cinder mixed	18.25	@	18.75
Standard Ohio Blackband	20.00	@	21.00
Southern No. 1	18.25	@	18.50
Southern Gray Forge	16.25	@	16.50
Southern Silvery	16.50	@	17.00
Jackson County (Ohio) Silvery	19.25	@	19.75
Old Car-Wheels	19.00	@	19.75
Old Iron Rails	25.00	@	25.50

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, November 19, 1889.

The general Iron and Steel situation in this district continues in a satisfactory condition. The situation is encouraging and there is every prospect of an active legitimate business for some time to come.

Pig-Iron.—There has been a fair business the past week, and the market is steady at the prices quoted for some weeks past. Demand is only fair, but the offerings continue light. Nearly every furnace in this district is sold up to the 1st of January, and consumers have very generally covered their wants for the same time. Brokers report business having fallen off and assign the cause above stated. The furnaces they represent are all sold ahead, and consequently they have no Iron to sell. Some of our oldest brokers have done little or nothing for two or three weeks, and it is not expected that there will be any material improvement during the remainder of the year. Consumers generally are well bought up until the close of the year, and unless something turns up unlooked for at present it is not likely that they will make additional purchases until January. Prices are firm, and there is nothing in the situation at present to indicate a decline. Ores are stiff. Coke threatens to go still higher, and the railroads in all directions are advancing rates. We quote prices as follows:

Neutral Gray Forge	$16.75	@	$17.00, cash
All Ore Mill	17.25	@	17.50, "
White and Mottled	15.50	@	16.25, "
No. 1 Foundry	18.00	@	18.50, "
No. 2 Foundry	17.00	@	17.50, "
No. 2 Charcoal Foundry	22.00	@	22.50, "
No. 1 Charcoal Foundry	24.00	@	24.50, "
Cold Blast Charcoal	25.00	@	28.00, "
Bessemer Iron	21.00	@	21.50, "

There is more inquiry apparently for Bessemer than any other kind of Pig-Iron, with but little offering, and the market is firm as quoted. There was a sale of 1200 tons of off Bessemer reported at $20, cash.

Muck-Bar.—There is but little call for delivery this month or next, buyers being pretty well supplied for the time in question; but there are buyers for the first quarter of 1890, with but few sellers. We are advised of sales for delivery during the next two or three months at $30.40 @ $30.50, cash, which may be regarded as the ruling prices. There is a possibility that immediate delivery might be bought at $30.

Ferromanganese.—There have been no sales reported and the market is in such an unsettled condition that it is useless to give quotations. Some consumers here are very low in stock; they have been buying along just as their wants required, looking every day for the market to break.

Manufactured Iron.—There is a good, steady demand for all kinds of finished Iron with the exception of Skelp, the inquiry for which always falls off at this season of the year. Prices unchanged: Bars, 1.80¢ @ 1.90¢; Tank and Plate, 2.35¢ @ 2.40¢; No. 24 Sheet, 2.95¢ @ 3¢; Skelp, 1.85¢ @ 1.90¢ for Grooved and 2.15¢ @ 2.25¢ for Sheared, all 60 days, 2 % off for cash. Structural Iron is quoted at 2.35¢ for Angles; 2.75¢ for Tees; 3.10¢ for Channels and 2.70¢ for Sheared Bridge-Plates.

Nails.—There is not much doing at present, nor is it to be expected at this season of the year, when business is always light; however, the outlook is promising for a good spring trade, which usually opens about the latter part of January. No change in price; $2.25, 60 days, 2 % off for cash. It is doubtful, however, whether maufacturers would be willing to contract for future delivery at present prices. Wire Nails are still quoted at $3, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—As stated in our last report, there is not so much new business, but the mills are all about as busy as they can be working up old contracts, and will be until the close of the present year. Prices firm but unchanged. Discounts on Black Butt-Weld Pipe, 30 %; on Galvanized do., 42½ %; on Black Lap-Weld Pipe, 62½ %; on Galvanized do., 50 %; Boiler-Tubes, 1¾-inch and smaller, 50 %; 2-inch and larger, 55 %; Casing, 5⅝ inch, 55 %.

Old Rails.—There has been but little doing in Old Iron Rails of late in this market; consumers appear to be supplied for the present and do not seem disposed to anticipate future wants. We can report sales of several small lots, all at $29, which may be regarded as the ruling price, From some sources of supply the price above quoted would not cover lay-

down cost. We can report a sale of Old Steel Rails, short pieces, at $22; long pieces supposed to be worth about $22.50.

Billets, &c.—Bessemer Steel Billets and Blooms are still quoted at $34 @ $35, cash, as to size, quality and delivery. Brokers continue to report that it is difficult to place an order for immediate delivery It is intimated in some quarters that contracts can be made for delivery next year below present prices, but this, to say the least, is doubtful, as there is no reduction in the cost of the raw materials and but little prospect of it at present.

Steel Rails—Are firmer and higher. Mills here are now demanding $35 for immediate or near-by delivery. The above price might be shaded if a good deal of latitude was given the seller in the way of delivery. Mills here as elsewhere are well supplied with orders and are not particularly anxious in regard to new business, especially as there is a possibility of prices going still higher.

Railway-Track Supplies.—Spikes are higher; 2.15¢, 30 days, delivered on cars here and 2.25¢, delivered at Cincinnati, Chicago or St. Louis; Splice-Bars remain unchanged at 2¢ and Track-Bolts at 3¢ with Square and 3.10¢ with Hexagon Nuts.

Old Material.—There is a fair demand and prices are steady. No. 1 Railroad Shop Wrought Scrap, $21.50 @ $22, net ton; Old Car-Axles, $26 @ $27; Cast Scrap, $15.50 @ $16, gross ton; Bloom and Rail Ends, $22 @ $22.50; Old Car-Wheels, $20 @ $20.50. There is a good demand for Car-Wheels west of Pittsburgh.

Cleveland.

CLEVELAND, November 18, 1889.

Iron Ore.—Vessel-owners are hurrying along their craft in a final effort toward closing up the remarkable season of 1889 in a creditable way. The recent increase in lake freights brought loss rather than profit to its projectors, but a sincere attempt is now being made to make amends. The dreaded lake storms of early winter are generally looked for in the first two weeks of December, and, in consequence, all the Ore still to come down will be rushed forward during the next 12 or 15 days. The total receipts for the season, including the Chicago shipments early in the year, are about 6,650,000 tons. The weaker of the lake vessels are tying up, but the heavy steamships will make another trip or two to Escanaba. The amount they will bring forward, together with the cargoes now on the way down and the all-rail shipments to come, will carry the total for 1889 slightly above the 7,000,000-ton mark. The amount would have been 250,000 tons higher but for the recent unwise and unfortunate attempt of the vessel men to advance transportation rates beyond reasonable figures. Of the 6,650,000 tons already unloaded it is estimated that 5,200,000 tons have come to Lake Erie ports. The 300,000 or 350,000 tons still to come will also be brought to Lake Erie ports, bringing the total to 5,500,000 tons. In 1888 the total receipts at Lake Erie ports aggregated 3,718,365 tons, and in 1887 3,439,198 tons. The demand for all grades of Ore is still excellent, but there are only scattering amounts to offer, and for these dealers are readily obtaining advances of 50¢ @ 75¢ ℔ ton. The Escanaba rate is still $1 ℔ ton.

The Ore dealers at Cleveland are already receiving inquiries from Eastern Steel manufacturers regarding prices for Ore for next season. The furnaces from which these requests are received hitherto depended almost exclusively upon foreign Ores. The dealers at Cleveland have not decided upon prices for 1890, but are encouraged to the belief by the prospective opening of this new field of operations that next season's quotations will mean fully as large profits per ton as have been realized in 1889 and that the output for that year will be between 8,000,000 and 9,000,000 tons.

Pig-Iron.—Bessemers are now quoted at $21 @ $21.50, cash, at the foundries, an advance of 50¢ ℔ ton, and No. 1 Foundry, all lake ores, at $18. Every furnace is being worked to its full limit to fill the enormous orders placed in October. These furnaces seem likely to be kept thus engaged until the close of the year, when activities will again be resumed. Although the inquiry, not only for Bessemers but for Forge Iron and American Scotch, is excellent, furnace men seem disinclined to take new orders. Quotations have improved, and the following are now announced as cash prices at the furnaces:

Nos. 1 to 6 Lake Superior Charcoal	$20.50 @ $21.50
No. 1, 2 and 3 Bessemer, ℔ ton	21.30 @ 21.80
No. 1 Strong Foundry, ℔ ton	17.80 @ 18.30
No. 2 Strong Foundry, ℔ ton	16.80 @ 17.30
No. 1 American Scotch, ℔ ton	17.80 @ 18.80
No. 2 American Scotch, ℔ ton	16.80 @ 17.80
No. 1 Soft Silvery, ℔ ton	18.00 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	16.30 @ 16.80
Mahoning and Shenango Valley Red Short Mills, ℔ ton	16.80 @ 17.30

Manufactured Iron.—Prices are firm and the market active. Bar-Iron is selling freely at 1.75¢ @ 1.80¢. Sheets of all numbers are as scarce as ever and are bringing sellers' prices.

The Michigan Ore Mine will be transferred on November 30 to Messrs. J. H. Wade, Selah Chamberlain, E. R. Perkins, S. L. Mather, Samuel Mather and W. G. Mather, all of Cleveland, for $385,000.

The Hemlock Mine has been sold to Pickands, Mather & Co., of this city, for $40,000.

It is understood that the Buffalo, South Buffalo, Queen and Prince of Wales mines are soon to be transferred to Mr. Ferdinand Schlesinger, of Milwaukee for $700,000.

Financial.

The single stirring event of the week was the announcement of the dethronement of Dom Pedro II of Brazil and the proclamation of the republic of the United States of Brazil. The coffee and rubber markets were at once thrown into confusion, coffee at the Exchange advancing sharply, and there were several European orders to buy. Spot coffee was in demand, but sellers gradually withdrew. The common impression was that the shipment of commodities from Brazil would not be interrupted, and in regard to other matters Dr. Barboza, the new Minister of Finance, announces that all contracts entered into by the imperial Government will be maintained. The effect on consols in London was slight, but there was lively selling in all South American securities. A feature of considerable moment to importers is the reduction of freight charges by the Cunard Line and the practical breaking up of the combination to keep freights up. The steamer Etruria on her next trip here will bring coarse goods at 10/ ℔ ton and fine goods at 20/, which is a reduction of about 20/ ℔ measurement ton. The general outlook for merchandise is favorable for distributors and importers. As a rule, business is active and in some lines booming. Dry goods jobbers report good orders for the fall trade. The cause is found in abundant grain and cotton crops, which are being moved forward to market, placing the farmer in funds and filling the channels of trade. Cattle-raisers, too, are prosperous, crowding the outgoing steamers with their herds. The flour movement is simply enormous. Minnesota and Dakota country millers are grinding about 750,000 bushels per week. Minneapolis millers alone last week exported 60,000 barrels. The close of navigation on the lakes is helping the east-bound roads, but the advanced flour and grain rates now taking effect are expected to operate as a check. New York canals close 30th inst.

The Stock Exchange market was active. Union Pacific was favorably influenced by reports of increased earnings, and Denver, Texas and Fort Worth by the statement that a traffic agreement had been made with the Union Pacific. Louisville and Nashville was strong on European purchases, and there was a rise in the coal shares. The trust properties were generally lower under the influence of a steady decline in Cotton-Oil, which touched the lowest point yet recorded. On Monday Tennessee Coal and Iron again experienced a remarkable advance, but speculation generally was checked by a reported weak market in London for Americans, due to fears that gold would be drawn from the Bank of England for Brazil. It is officially announced that the total subscriptions to the $12,500,000 of new 4 % consols of the Atchison Company offered to the stockholders are $18,454,000. On Tuesday stocks were irregular and lower at the close, with Sugar Trusts weaker, and there was a drop in Tennessee Coal and Iron.

United States bonds were quoted as follows:

U. S. 4½s, 1891, registered	104⅝
U. S. 4½s, 1891, coupon	105½
U. S. 4s, 1907, registered	127
U. S. 4s, 1907, coupon	127
U. S. currency 6s	117½

Sterling exchange was dull at $4.81½ @ $4.86.

The merchandise markets were generally steady. Respecting wheat Clapp & Co. say: "The world's visible is now from 15 to 20 % less than a year ago, the shortage being about equally distributed in Europe and this country. Our visible and that afloat is less than three-fourths of that a year ago., and near 18,000,000 less than the average quantity the past five years." Spot wheat is very quiet. Rio coffee is officially reported unchanged, but tends upward. Sugars, too, are quite firm and are held at an advance. Ocean tonnage is wanted for grain. Charles R. Flint, treasurer of the New York Commercial Company, received a cable from Para reporting an advance in the price of rubber of 50 reis. Market firm. Rubber in this market on Tuesday was lower, Europe selling. Coffee was lower.

The weekly bank statement shows an increase of $1,310,725 in the reserve, so that not only is the deficiency of the previous week made good but the banks have a surplus beyond legal requirements of $549,875. In loans there was a contraction of $1,932,000. The increase in specie and legal tenders combined was $1,836,700. Money has ruled fairly easy. Time money is quoted 6 % for all periods on mixed collateral and 5½ % on dividend-paying stocks. A fair demand for commercial paper is reported. The best double-name paper is quoted at 5½ @ 6½ % and prime single-name at 6½ @ 7½ %.

For the first time in many weeks the currency movement has run in favor of the city banks.

On Monday a flurry was caused by unauthorized rumors to the effect that Secretary Windom had decided to withdraw $47,000,000 of public funds now on deposit with national banks. The Secretary upon being interrogated said it was not his purpose to make any such wholesale withdrawal, but he fully recognized the necessity of calling in such portion as could be withdrawn from the banks without serious inconvenience to trade and commercial interests as early as practicable. The Secretary said that withdrawals when made will be for the sole purpose of reinvestment in United States bonds. The par value of the bonds last purchased

by the Treasury Department was $347,500, of which $223,000 were 4 per cents at 127 and $114,500 were 4½s at 105¾.

The exports of breadstuffs, provisions, cotton and petroleum in October were $74,529,760, against $55,810,612, and for ten months $438,909,227, against $360,123,187. This is a gain of $18,719,148 for the month and $78,786,140 for the year to date. The wheat exports for the month and the year are less than last year and flour is behind more than 1,000,000 bushels for the year. Corn gained 12,230,967 bushels in the month and more than 33,000,000 bushels for the year. The value of all breadstuffs exports, notwithstanding the great decrease in corn, was about the same as in October of last year, prices being lower. The value of exports of petroleum was also about as in October, 1888. Provisions and cotton show a very large increase, as follows:

	October—	
	1889.	1888.
Provisions	$12,704,857	$7,535,277
Cotton	45,348,540	31,632,519
Together	$58,053,397	$39,167,796

In a single month these two items of export increased $18,885,601. For ten months the increase was the very large sum of $67,451,008, the gain being about equally divided between the two items.

Foreign imports for the week were valued at $8,973,895 and the exports $5,920,563. The latter included 500,000 bushels of corn, 400,000 bushels of wheat and 20,000 bales of cotton. Exports of specie were $323,000.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, } New York, November 20, 1889. }

American Pig.—Some of the sellers of Southern Iron report inquiries for round lots for delivery for the whole of 1890, and state that sales of Gray Forge have been made under these circumstances at $18.25, while $20 @ $20.50, delivered, is quoted as the asking price for all 1890, delivery in round blocks. Current business is decidedly light, however, so far as sellers in this market are concerned. Agents for Southern furnaces report that so far as Newport News is concerned the embargo is lifting, shipments having been resumed on quite a liberal scale. In the other Southern ports the accumulation of Pig-Iron awaiting shipment continues. We quote No. 1 Foundry, early delivery, $18.50 @ $19 and No. 2 $17 @ $18, at tide-water.

Spiegeleisen and Ferromanganese.—The market is quiet, the only transaction of any consequence having been the sale of a 1000-ton lot at $34, a price which was made possible by specially low freights. Sellers now at $35 @ $35.50. Ferromanganese has been sold for future delivery at $92 @ $92.50, while for spot lots $100 is asked.

Billets.—Inquiries are numerous, partly due to the delays in deliveries to customers, which seem to characterize the operations of nearly every Steel-works now. We do not hear of any recent sales, and quotations, in the absence of any transactions, are nominal at $34 @ $35, at Eastern mill, while special Billets are bringing $42 and upward. The delay in shipments is very serious and will lead to the stringing along of deliveries far into next year for stuff which was contracted for this year.

Wire-Rods.—Beyond small sales of domestic Rods at about $50, at sellers' mill, transactions have been very light. There is some demand for foreign Rods, but prices are prohibitive, sellers naming $53 @ $54 for No. 5.

Old Rails.—The market continues very quiet, the only transaction of any moment recorded being the sale of about 500 tons American Tees, Sound port, at $24.25.

Steel Rails.—Some of the sellers of Steel Rails have had informal conferences during the week to discuss the situation, the concensus of opinion being that in view of the advance in and the uncertainty concerning the future in raw materials, any price below $35 at mill is not safe. The Rail mills, particularly those which depend largely or exclusively upon Lake Ore as a raw material, or purchase from furnaces using Lake Ores, are certainly in a slightly embarrassing position. They do not know yet what their raw material is going to cost them next year and yet are asked to bid upon business for which they cannot yet cover themselves. Those in the East who are secure in a part of their supply of raw material, through ownership in mines at home and abroad, are less fettered, but they do not seem inclined to take any chances. Still, there is a minority in the trade who are far from taking a sanguine view of the future. They point to the fact that the demand for next year for Rails is by no means heavy. Up to November 1, according to official reports, the sales of standard Rails were little less than 300,000 tons. It is estimated that the business practically secured now aggregates somewhere between 650,000 and 700,000 tons. But this includes the renewals of the majority of the great systems. It is figured out by one of the Rail-sellers, who, however, is credited with having some interests as a buyer, too, that the renewal demand, liberally estimated, will figure out about 915,000 for 1890. To that must be added the requirements for new mileage. Thus far the attention of financiers has been given almost wholly to reorganization schemes, and the outlook for the floating of many new enterprises is not particularly brilliant But it is urged the demand for Soft Steel has been so great that it occupies a part of the capacity of quite a number of Rail-mills and makes the cost of raw materials to the others dearer. That is true. With the advance abroad a demand equal to at least 200,000 tons a year was thrown upon our Steel-works. It came suddenly. But the adjustment is taking place; in fact, the rise in Soft Steel has been so great that Wrought-Iron has lagged behind. The inevitable result is that prices for Plates, Nails, Shapes and a good many other finished articles show a sharp difference in favor of Iron. This is bound to cut off the demand for Steel in many channels in which it has gained a good foothold or had secured the supremacy. Muck-Bars and Mill Iron are so much cheaper than Steel Slabs and Billets and Bessemer Pig that manufacturers will turn to them. This is a feature which must not be left out of consideration. The event of the week in Steel-Rail circles was the sale of a lot of 5000 tons at $35, a sale to which much prominence has been given, but which is surrounded with circumstances which rob it of much significance. It was made to a speculator. A number of the mills quote $35, but outside of the sale noted we have not heard of a single transaction of any magnitude at that price. It is apparently the quotation of those who do not care to sell Rails. There is unusual reticence at this juncture concerning actual selling prices and concerning the figures at which business would be taken. But some of the sellers who are in the market are quite emphatic in scouting the price named, although they show hesitation in giving any figures at which they themselves are willing to make contracts with good parties. Rumors of offers as low as $32 by middlemen are circulated, but cannot be traced to any authoritative source. At least one maker considers $33 @ $34 a fair quotation.

Metal Market.

Copper.—Since our last week's report the London market has displayed a good deal of activity, the sales aggregating 2550 tons and spot Copper advancing from £45. 5/ to £47. 15/ this forenoon, while futures improved from £45. 10/ to £48, the consumptive demand being good, and available Copper, both lake and casting, in limited supply. The former advanced in our own market to 13¢, spot and November, and the latter to 11⅛¢ @ 11¼¢. Lake closes firm to-day at 13¢.

Tin.—Spot Tin gave way in the London market during the week from £96. 5/ to £95. 5/, and futures from £95. 17 to £94. 17/6, sales summing up 1140 tons. In our own market some 300 tons changed at a gradual decline of 30¢ ℔ 100 lb, November down to 21.35¢, January to 21.05¢, February to 21.15¢, and spot is worth 21.30¢ at the close to-day, after a sale of 10 tons at the Metal Exchange at that figure, 10 tons January at 21.15¢ and a like amount at 21.10¢ and 25 tons December at 21¼¢. *Tin-Plates.*—As we are between seasons the demand for Tin-Plates is only moderate; prices, however, show no signs of giving way, the position on the other side being such a strong one that dealers are afraid to make concessions, as they believe it will be impossible to replace the goods. Some inquiries for futures are being put forward, but it is difficult to find sellers unless at extreme prices. English exportation during the first 9 months has been 327,310 tons, against 297,217 in 1888 and 267,666 in 1887, out of which the United States received respectively 258,685, 222,171 and 203,791. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5.25 @ $6; Coke finish, $5.20 @ $5.25; Coke Tins, Penlan grade, $4.75 @ $4.80; J. B. grade, $4.85 @ $4.90, and Wasters, $4.50 @ $4.55.

Lead.—Only 100 tons were taken in a jobbing way at 3.75¢ @ 3.85¢, which is the closing quotation. The Western markets quote 3¾¢.

Spelter.—Is firmer; some 75 tons were sold at 5.12½¢ @ 5.20¢, the latter figure for a special brand, and the closing quotation is 5.15¢ @ 5.20¢, as to brand; Silesian is nominally 6.90¢ @ 7¢.

Antimony.—While there continues to be a good demand, there is no stock, and Cookson's brand has brought as much as 28¢ in consequence, Hallett's being held at 20½¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, November 14.

50 tons Tin, December	21.40¢
85 tons Tin, February	21.35¢
10 tons Tin, January	21.35¢
100 tons Iron, December	$18.62½

FRIDAY, November 15.

200 tons Iron, February	$19.50
20 tons Tin, January	21.00¢
20 tons Tin, February	21.00¢
20 tons Tin, March	21.00¢
20 tons Tin, February	21.35¢
10 tons Tin, January	21.35¢

SATURDAY, November 16.

10 tons Tin, December	21.40¢

MONDAY, November 18.

10 tons Tin, December	21.40¢

TUESDAY, November 19.

10 tons Tin, November	21.30¢
30 tons Tin, November	21.25¢
10 tons Tin, January	21.05¢
10 tons Tin, spot	21.30¢
10 tons Tin, January	21.15¢
25 tons Tin, December	21.25¢
10 tons Tin, January	21.10¢
10 tons Tin, December	21.30¢
10 tons Tin, March	21.20¢

Inquiries have been received by importers having close relations with manufacturers of pig-iron for quotations on American coke for shipment to England. Prices for Coke have risen to 24 to 27 shil-

lings or about $6 per ton. As yet no engagements have been made, the freight question on so bulky an article being difficult to manage, even if railroad transportation from the coke regions to tide-water were easily handled. Apparently the best chance is for Pocahontas coke.

Imports.

Hardware, Machinery, &c.

Alenquist, A. W., Mach'y, cs., 21
Boker, Hermann, Arms, cs., 21
Folsom, H. & D. Arms Co., Arms, cs., 8
Hartley & Graham, Mdse., cs., 18
Lau, J. H. & Co., Arms, cs., 3
Meachim, E. C. Arms Co., Mdse., cs., 9
Merch. Desp. Co., Cutlery, cse., 1
Stoddard, Lovering & Co., Mach'y, cs., 12
Sellers, W. B., Mdse., cse., 1
Schoverling, Daly & Gales, Arms, cs., 23
Thebaud Bros., Mach'y, pkgs., 13
Taylor, Thos., Mdse., cs., 5
Van den Toorn, Arms, cs., 5
Werlemann, H., Arms, cs., 19
Order—Mach'y, pkgs., 62

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, November 20, 1889.

There has again been a large speculative business in Pig-Iron, and, while prices for warrants have ruled irregular, the undertone has continued strong. Scotch warrants, after selling below 62/, advanced to 63/8, and Cleveland Pig has moved up to 68/6. The remarkable movement of price of the latter is attributed in part to a belief that attempts are making to "corner" the market and that success in that direction is possible. As regards warrants the feeling is different, as the holdings are widespread. In Hematites there has been a brisk trade, and legitimate business, although checked by the high prices resulting from speculative buying, is still large. Business was done at 77/6. Spiegeleisen is quoted 6d. up. Makers are quoting 7/6 advance on Steel Rails, 10/ on Blooms, 12/6 on Billets, 2/6 on Slabs, 2/6 on Wire Rods and 5/ on Crop Ends. In Old Materials there have been large transactions, but prices are unsettled.

Inquiries for Tin-Plate have been larger, and buyers have shown anxiety to place orders. Makers are very firm at last week's highest prices The Villiers Company are about to erect three additional mills.

Copper has been active and irregular, with transactions large in both Bars and Ingots, including good speculative buying and liberal purchases for consumption. It is estimated that sales during the first half of the month amount to about 10,000 tons, including a large quantity of Bars for forward delivery for the account of Chilian producers at the advance. These sales are believed to be in advance of the amaunt held there. The charters for the fortnight are advised as 1500 tons. Stocks have decreased 1700 tons. Transactions in furnace material the first half of the month embrace 1350 tons American at advanced prices. James Lewis & Son's record includes 100 tons Montana Matte at 8/3; 450 tons ditto at 8/4½; 100 tons ditto at 9/; 100 tons ditto on private terms; 300 tons Anaconda Matte at 8/9 and 300 tons ditto at 9/, all to arrive in Liverpool.

The ship Queensmore, with 818 tons Matte on board, has been sunk, but it is expected that the cargo will be recovered.

The trade demand for Block Tin has been active, but values have fallen on account of free offerings by importers and pressure to sell forward. The lowest sales of prompts were at £95. Transactions have diminished the past few days. In futures business at as low as £94. 10/ was reported to-day.

Scotch Pig.—In makers' brands there has been a good business at irregular but generally higher prices.

No. 1 Coltness,	f.o.b.	Glasgow	79/
No. 1 Summerlee,	"	"	79/
No. 1 Gartsherrie,	"	"	78/6
No. 1 Langloan,	"	"	78/
No. 1 Carnbroe,	"	"	67/
No. 1 Shotts,	"	at Leith	78/
No. 1 Glengarnock,	"	Ardrossan	78/
No. 1 Dalmellington,	"	"	68/
No. 1 Eglinton,	"	"	65/6

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

Cleveland Pig.—Business large but prices very irregular and unsettled. No. 3 Middlesborough quoted 68/ for prompt.

Bessemer Pig.—Prices have been unsettled but the market strong and active. West Coast brands, mixed numbers, 77/6, f.o.b. shipping point.

Spiegeleisen.—Prices are 6d up and the market is strong at the advance. English 20 % quoted 92/6, f.o.b. at works.

Steel Rails.—The demand continues brisk and makers' prices have been advanced. Heavy sections quoted at £6. 17/6 and light sections £7 @ £7. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—Market strong and fairly active. We quote £6. 10/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market strong and prices higher. Bessemer, 2½ x 2½ inch, £6. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—More doing in these and prices strong and higher. Bessemer, £6. 2/6, f.o.b. at N. W. England shipping point

Old Rails.—The market without important change Tees quoted at £3. 10/ @ £3. 12/6 and Double Heads £3. 12/6 @ £3. 15/, f.o.b.

Scrap-Iron.—Demand continues fairly active and prices are strong. Heavy Wrought quoted £3 @ £3. 2/6.

Crop Ends.—The demand only fair, but higher prices asked. Bessemer quoted £3. 12/6, f.o.b.

Tin-Plate.—Demand good, but business limited by high prices asked. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	18/ @ 18/6
IC Bessemer Steel, Coke finish	16/6 @ 16/9
IC Siemens " " "	16/9 @ 17/
IC Coke, B. V. grade	16/ @ 16/3
Charcoal Terne, Dean grade	14/6 @ 15/

Manufactured Iron.—There has been a good business in this line, but prices show no further change. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	9	10	0	@	0	0	0
" Common "	8	0	0	@	8	5	0
Staff. Bl'k Sheet, singles	9	10	0	@	9	12	6
Welsh Bars (f.o.b. Wales)	7	12	6	@	7	15	0

Copper.—Prices somewhat irregular. Market quite active. Chili Bars quoted at £47 @ £47. 10/, spot, and £47. 17/6 @ £48, three months' futures. Best Selected, £52 @ £52. 10/.

Tin.—The market rather weak under pressure to sell. Straits quoted at £95, spot, and £84. 10/ for three months' futures.

Spelter.—The market steady but rather quiet. Quoted at £23. 2/6 for Ordinary Silesian.

Lead.—Demand fairly active and the market firm. Quoted £13. 10/ for Soft Spanish.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

CHILI.

VALPARAISO, September 13, 1889.—*Copper.*—Mine-owners are still holding back in hopes of an improvement, the present quotation not being remunerative. Sales for export were thus restricted for the fortnight to 8825 quintals at $16 @ $16.10 ₱ quintal, f.o.b., which, with 30/ freight per steamer and 25⅝d exchange, equals £40. 17/4. *Coal.*—The national holidays interrupted dealings therein. *Exchange.*—Has been dull at 25⅝d @ 25⅞d for 90 days' sight on London.—*Weber & Co*

HOLLAND.

ROTTERDAM, November 9, 1889.—*Tin.*—Following are the statistics of Tin in Holland for September and October:

	End of Sept., 1889. Slabs.	End of Oct., 1889. Slabs.	End of Oct., 1888. Slabs.
Banca stock on warrants	35,328	20,750	21,200
Billiton stock in Holland	31,064	25,465	14,146
Totals	66,392	46,215	35,346
Banca deliveries during the month	12,750	14,578	11,500
Billiton deliveries during the month	9,596	10,599	7,517
Totals	22,346	25,177	19,017
Banca deliveries since January 1	117,736	122,314	113,400
Billiton deliveries since January 1	68,299	78,898	72,353
Banca afloat	.....	.....	4,200
Banca stock, awaiting coming auctions	131,644	149,644	130,361
Billiton afloat	35,770	50,920	38,200
Price of Banca, fl	55¼	59¾	63½
Price of Billiton, fl	54¾	59½	62¾

Export of Tin from Holland.

	Eight months.		
	1889. Tons.	1888. Tons.	1887. Tons.
To Germany	4,235	4,285	3,595
To England	124	124	127
To Belgium	653	588	671
To France	178	314	257
To Hamburg	358	292	406
To the United States	265	225	371
To other countries	360	478	553
Totals	6,173	6,306	5,980

—*De Monchy & Havelaar.*

EAST INDIES.

PENANG, October 1, 1889.—*Tin.*—Receipts during the fortnight sum up 10,000 piculs; Europeans meanwhile bought 12,300 piculs and Chinamen 500. Opening at $34 ₱ picul, the market gave way to $33.25, at which it closes. *India Rubber.*—Some 40 piculs changed hands at $65. *Gum Benjamin.*—Has in a moderate way been selling at $43 ₱ picul No. 2 and at $60 for choice.—*Schmidt, Kustermann & Co.*

SINGAPORE, October 2, 1889.—*Tin.*—Our last report was dated 19th ult., since when, under the influence of a slightly weaker feeling in London and an advancing exchange, the price has declined to $33.37½ ₱ picul, at which we close steady. Supplies are very moderate; in fact, there is scarcely sufficient to meet the demand. *Gum Copal.*—There have been no purchases of Macassar quality since our last. *Gum Damar.*—Arrivals have been very small and confined to low qualities. *Tonnage.*—London rates are weaker at 27/6. *For New York via Cape.*—The Romanoff has been transferred from the Boston berth and loads at 25/, dead weight. *For Boston.*—There has been no fixture to replace the above. Following have been the Tin shipments from the States during the first eight months of the six years 1889 to 1884 respectively, in piculs: 92,049; 22,289; 59,481; 52,817; 20,252, and 41,857. In September the following steamers took Tin for New York, the first named from Penang,

and the remainder hence: Ganges, 421; Preussen, 841; Gleneagles, 842; Gulf of Mexico, 252, and the American bark Erie J. Ray, from here for Boston, 420. *Exchange*—Is very firm at 3/2⅝ for six months' sight credit drafts.—*Gilfillan, Wood & Co.*

MANILA, November 11, 1889.—*Hemp.*—There are buyers at $13.87½ ₱ picul, against $11 same date last year, equaling ₱ ton, cost and freight, £44. 2/6, against £38. There have been no clearances for the United States since last cable, against 14,000 bales last year; since January 1, 168,000 bales, against 198,000 in 1888. There remain loading 17,000, against 28,000; cleared for England since January 1, 272,000 bales, against 294,000; loading for do., 14,000, against 15,000; cleared for all other ports, 44,000, against 63,000; receipts at all other ports since last cable, 4000, against 7000; since January 1, 500,000 bales, against 563,000 in 1888 and 472,000 in 1887. *Freight.*—$5 50, against $7. *Exchange.*—Six months' sight, 3/5¼, against 3/7.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street*

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Pittsburgh.

The Bessemer Pig-Iron market is firmer. Sales of some 15,000 tons are reported at $21.25 @ $21.85, cash, Pittsburgh; 1000 tons Gray Forge at $17, cash. There appears to be a firmer feeling all round.

Chicago.

The demand for Pig-Iron grows stronger and inside figures are being advanced. Good-sized sales of local Irons have been made at $18.50, cash, for No. 1, which is now rock-botton. Ohio and Southern Irons have been sold in lots of 100 to 500 tons by dealers who are still able to secure Iron to sell. Some Southern Gray Forge can be had, but $17.50 is asked. Tennessee Charcoal is now up to $20—as high as Lake Superior Charcoal. The Bar-Iron market is active. Old Iron Rails are very firm, with sales at $26.25. One thousand tons of Old Wheels sold at $19.50. Jobbers put Steel Nails at $2.50, but concluded to make Wire Nails only $3.15, instead of $3.25, as at first proposed. Barb-Wire is unchanged, but the meeting of manufacturers at Cleveland Thursday may have an important bearing on price.

Cincinnati.

Southern furnaces which will sell only at warrant prices and for long delivery are practically out of the local market, as buying here is largely for consumption, and consumers will not as yet pay the extreme rates current, especially as they have been enabled to secure a number of lots ranging from 800 to 1000 tons and aggregating about 15,000 tons of Northern and "outside" Southern Iron at about 50¢ less than the basis quoted Monday. The tendency, however, is strongly upward. The sales referred to were largely Gray Forge, No. 3 Foundry and No. 2 Soft. Five hundred tons Gray Forge sold last evening at $16.35, cash, and now held at $16.50. There is no excitement.

Philadelphia.

There are no new features in the market to-day. The demand for everything is close on to the supply, so that there are no reactions whatever. Orders for moderate quantities, early deliveries, are accepted at quoted rates. For extended deliveries advances of more or less importance are demanded. The recent advance in freights is considered unwarranted and complaints are both loud and deep.

Cleveland.

About 20 vessels have been chartered for final trips from Escanaba to lower lake points at $1. The shipping season will be at an end in ten days. The inquiry for Bessemer and Gray Forge Irons is still remarkably heavy. Few orders are being placed, however, furnace men having all they can do to fill orders already booked. Two sales of Bessemer at $21 at the valley furnaces are reported. The demand for old American Rails at $26.50 is persistent, but sellers demand more money and but few sales have occurred.

St. Louis.

There is no change in the general situation in Pig-Iron. The report of the 18th inst. is adapted to the conditions prevailing to-day. Bar-Iron and Barb-Wire show no change. Wire Nails have been advanced from $3 to $3.15 rate for any quantity.

Coke as Locomotive Fuel.

A. W. Sullivan, the acting general superintendent of the Illinois Central Railroad, gives in the *Railway Age* experiments made on that road with coke from Illinois coal. He states the chief objections thus: "The reduction of the exhaust nozzles to stimulate the draft, so potent usually in improving the steaming of coal-burning engines, failed to operate with coke, from the fact of its not having sufficient weight to retain its position in the furnace. Pieces of large size were lifted from the fire and drawn partially into the ends of the flues, where they became fixed, stopping up the flues, as many as 60 having been found on one occasion plugged with coke at the end of a trip made with slightly reduced exhaust-nozzles. Being thus restricted in the use of the exhaust, and other expedients failing to give a uniform and requisite pressure of steam, it became evident that the heating-surfaces of the engines were not of sufficient area to successfully use coke under all conditions of weather and service, which view was confirmed during the period of intensely cold weather in February, 1885, when all the engines using coke failed more or less in service, compelling temporary resort to coal until the weather moderated.

"The advantage to be derived from the use of coke was freedom from smoke; but this advantage was in a great measure offset by objectionable gases, also by fine sparks and dust, which were thrown from the stack in great quantities and falling upon the train entered the cars through the doors, windows and ventilators. As cleanliness could not thus be maintained, it was deemed advisable to seek other means of accomplishing the end desired, and at the same time to avoid the disadvantage attending the use of coke. This led to experiments extending over several months in the use of fire-brick arch and extension front end with coal for fuel, the results of which have been so satisfactory that alterations embodying these improvements have been made in all the engines."

Recent experiments on the Baltimore and Ohio Railroad with Connellsville coke have given very satisfactory results.

The best day's record of the Scranton Steel Company's Bessemer plant is astonishing, considering the fact that it is only a two-vessel plant. On Tuesday, November 5, the day turn made 71 heats, producing 491 tons 16 hundred-weights. The night turn followed with 70 heats, making 483 tons 6 hundred-weights, a total of 141 heats and 975 tons 3 hundred-weights. It should be stated, however, that during the night turn one of the cupolas leaked so that five hours' work was lost. Had it not been for this disturbance the product would have been 1040 tons.

The proprietor of North Cornwall Furnace, at Cornwall, Pa., has made arrangements to have the furnace rebuilt and enlarged, and it will shortly go out of blast for that purpose, after a continuous run of four years. It will be equipped with three 20 x 60 feet Whitwell stoves and a draft-stack 18 x 80 feet, to be erected by Jas. P. Witherow, of Pittsburgh, Pa. The furnace-stack will be rebuilt with a new column and mantel-base, and made 18 x 80 feet. It will be fitted up with wrought-iron bosh-jackets and bronze bosh-boxes, and be arranged for nine tuyeres. There are also being erected 480 horse-power Babcock & Wilcox boilers, to be used in connection with the old boiler plant. Riter & Conley are erecting a new iron hoist-tower in place of the brick one now in use, and the hoisting-engine will be supplied by the Crane Elevator Company. With this furnace rebuilt, the two Bird Coleman furnaces, at Cornwall, Pa., and Donaghmore Furnace, at Lebanon, Pa., owned by the Cornwall Iron Company, Limited (composed of Mrs. A. C. Alden, Mrs. M. C. Freeman and Miss S. H. Coleman), and the Robesonia Furnace, at Robesonia, Pa., owned by the Robesonia Iron Company, Limited, more than one half of the output of Cornwall iron will be controlled by W. Coleman Freeman, chairman of said companies.

A deal has been concluded by which a new steel company secured 55 acres of land along the lines of the Reading and Pennsylvania railroads and adjoining the Schuylkill Canal. The tract includes the old Union Foundry. The company will begin at once the erection of large steel-works and kindred industries which will ultimately involve an expenditure of over $1,000,000 and furnish employment to 1000 or more men.

A contemporary observes that with the development of manufactures in the Southern States it seems probable that the former stronghold of free trade may become the citadel of protection, while the demand for free raw material by the well-established factories of New England and the Northern States appears to be urging public opinion at the North in the direction of freer trade.

The New Process Twist Drill Company, Taunton, Mass., will build a two-story brick 50 x 60 foot addition to their factory and put in new machinery for making hot-forged twist drills. A general readjustment of the plant will be made to meet the demand for these drills.

The Pennsylvania Railroad car-shops at Altoona employ 5000 men. Five men can begin and finish a coal-car in one day. The company turn out 400 freight-cars and 20 passenger-cars a month and repair 4000 freight-cars and about 40 passenger-coaches a month.

Something entirely new in the way of coal-breakers is being built at Drifton, Pa., where Eckley B. Coxe has in process of erection a structure the main parts of which are of iron. It is now nearing completion. The breaker will have a capacity of about 1800 mine-cars per day. The new breaker is the first one to be built of iron, and it remains to be seen whether or not such a building will prove practicable.

It is reported that the Mexican Government contemplates the imposition of a special and almost prohibitive duty on machinery from the United States.

Hardware.

The volume of business continues good; seasonable goods have a fair share of attention. There is some disposition to purchase staple lines, which have not materially advanced, somewhat in excess of requirements, but as a rule the trade at large are not placing speculative orders and are somewhat skeptical as to the permanency of some of the advances which have been made.

Wire Nails.

The prevailing prices on these goods are regularly maintained and the market in this respect shows a slight improvement since last week, when in one or two instances quotations slightly below the regular ones could be obtained. The price remains $3.10, at mill, an abatement of 10 cents per keg being made in carload lots. The papered goods are also firmer.

Barb-Wire.

The market has experienced no important change since our last report, prices being well maintained with a good demand. The negotiations in regard to the Barb-Wire consolidation are continuing, but until they are completed it is impossible to give definite information in regard to the movement, the adjustment of the different interests being a complicated and not altogether easy task.

Cut Nails.

The volume of new business is falling off as the quiet season is being approached. Deliveries, however, continue heavy. Iron Nails, which we quote at $2.10, New York, are still so much under Steel Nails and under Wire Nails that any advancing tendency must be reflected first in the Iron Nails. The scarcity and advancing tendency of Mill Iron point in this direction. The further rise in Bessemer Pig in the West during the last day or two points in the direction of still dearer raw material for manufacturers of Steel Nails and Wire Nails. Generally speaking, a difference of 20 cents a keg of Steel Nails over Iron Nails is not regarded by consumers as being warranted by what difference in quality may be claimed. For the near future, therefore, the Iron Nail may be regarded as having recovered its supremacy, at least in the East.

Miscellaneous Prices.

Picks and Mattocks are somewhat firmer in price, but many of the jobbing houses are offering the goods at the old prices.

The Wire market is very firm and another advance has been made.

Sand-Paper continues without change at the low prices which have been ruling for some time. Leading brands in good lots can be purchased from the manufacturers at 60 per cent. discount, and other brands not so favorably known at considerably better prices.

Manufacturers of Chisels and Drawing-Knives are naming slightly higher prices for these goods, and the market is characterized by a better tone than has recently prevailed.

The manufacturers of Tire-Bolts announce an advance, the revised prices being represented in the following, which are those of the Portchester Bolt and Nut Company, Portchester, N. Y.

	Discount.
Empire	67½ %
Keystone and Philadelphia	80 %
Norway Philadelphia	75 %

The American Screw Company, Providence, R. I., have issued a discount-sheet in which the above change in Tire-Bolts is announced, together with Sleigh-Shoe, Stove and Sink Bolts and Stove-Rods. Their revised quotations on these goods are as follows:

	Discount.
Tire-Bolts, Norway Philadelphia	75 %
" " Eagle "	80 %
" " Bay State	67½ %
Sleigh-Shoe Bolts	75 %
Stove-Bolts, flat head	62½ %
" " " " annealed	62½ %
" " round head	62½ %
Stove-Rods	62½ %
Sink-Bolts	62½ %

The manufacturers of Agricultural Wrenches have made a slight advance, and as a regular price to the retail trade discount 75 and 10 per cent. is named.

Russell, Burdsall & Ward, Portchester, N. Y., announced yesterday the withdrawal of all quotations owing to the advance in the cost of material. It is stated that unfilled orders will be charged at old prices.

Malin & Co., Cleveland, Ohio, announce the following advanced quotations on their Spool-Wire:

	Discount.
Annealed and Tinned	55 %
Brass and Copper	45 %

A. J. Jordan, St. Louis, Mo., whose factory is in Sheffield, England, has issued a 72-page catalogue of the AAA1 Cutlery and Cutlery-Cases which he is putting on the market. Illustrations are given of the extensive line of Pocket Cutlery, in which are many unique and elegant patterns, the quality and finish of the goods being especially emphasized. A line of Scissors is also shown, and Razors are given a prominent place, among them being his well-known AAA1 Razor, the popularity of which is referred to, and the Old Faithful Razor. It is stated that the blades are forged in his Sheffield factory, then sent to Hamburg, Germany, where they are ground and set ready for use, after which they are returned to the factory and after being examined are shipped to the St. Louis house. A number of sets containing Scissors, &c., for ladies' use and others containing Table Cutlery, together with special Knives, are illustrated. The following discount-sheet applies to the catalogue and illustrates the variety of goods shown in it.

	Discount.
Pocket and Pen Knives	50 %
Erasers	50 %
River-Shears	40 %
C. B. Shears	40 %
Scissors	40 %
Razors	50 %
Razor-Strops	50 %
Razors in Cases	50 %
Razor-Cases—Empty	50 %
Shaving Cases	50 %
Ladies' Sewing Companions	33⅓ %
Scissors in Cases	33⅓ %
Nail-Nippers	40 %
Nail-Files	40 %
Instruments	50 %
Oil-Hones	50 %
Water-Hones	50 %
Carvers and Steels	50 %
Carvers in Cases	50 %
Ivory-Handle Knives	30 %
Cutlery-Cases	50 %
English Cook-Knives	33⅓ %
Hotel Slicers	33⅓ %
Boxwood-Handle Butcher-Knives	33⅓ %
" " Skinning-Knives	33⅓ %
" " Sticking-Knives	33⅓ %
" " Boning-Knives	33⅓ %
Potato-Knives	33⅓ %
Shoe-Knives	33⅓ %
Lemon-Saws	33⅓ %
One-Arm Knives	33⅓ %
Farrier's Knives	33⅓ %
Pallet-Knives	40 %
Bowie-Knives	50 %
Fruit-Knives	50 %
Butter-Knives in Case	50 %
Pickle-Forks in Case	50 %

The following is the revised price-list of manufacturers' sizes of Hot-Pressed Nuts, Square and Hexagon, to which reference was made in our last issue:

Hot-Pressed Nuts.

Size of Bolt.	Square.	Hexagon.	Size of Bolt.	Square.	Hexagon.
¼	13.	20.	1⅛	8.2	....
5/16	11.5	16.	1¼	8.3	9.8
⅜	10.	13.	1¼	8.3	....
7/16	9.	11.2	1⅜	8.3	9.8
½	9.	11.2	1½	8.8	10.
½	8.7	10.5	1⅝	8.8	10.5
9/16	8.5	10.3	1¾	9.3	10.5
⅝	8.5	10.3	1⅞	9.3	11.
⅝	8.4	9.9	2	9.3	11.
¾	8.3	9.8	2⅛	9.3	11.5
¾	8.2	9.6	2¼	9.6	11.5
7/8	8.2	9.6	2⅜	9.6	11.8
7/8	8.2	....	2½	9.8	12.1
1	8.2	9.6	2¾	10.5	12.5
1	8.2	....	3	11.	13.
1⅛	8.2	9.6			

Stanley Works, New Britain, Conn., and 79 Chambers street, New York, have issued under date November 8 another discount-sheet in which the following changes are made. Terms net cash, 30 days or 2 per cent. for cash in 10 days:

	Discount.
Bronzed Loose-Joint Butts, Nos. 212, 213, 214, 215	25 %
Bronzed Loose-Pin Butts, Nos. 240, 241	25 %
Bronzed Light Narrow Butts, Nos. 282, 283, 284	40&10 %
Bronzed Light Narrow Loose-Pin Butts, Nos. 286, 287, 287½	40&10 %
Bronzed Light Reversible Butts, Nos. 288, 288½, 288¾, 289, 289½, 289¾	40&10 %
Bronzed Extra-Light Butts, No. 290	40&10 %
Bronzed Broad Butts, Nos. 291, 291½, 291¾	40&10 %
Bronzed Light Loose-Joint Butts, No. 292	40&10 %
Bronzed Light Inside-Blind Butts, Nos. 330, 331, 332, 333, 333½, 334, 335, 338	40&10 %
Bronzed Shutter-Butts, No. 344	40&10 %
Japanned Loose-Joint Butts, Nos. 700, 701, 702, 703	60 %
Japanned Loose-Joint Butts, No. 704, 706, 708, 709, 710, 711	60 %
Japanned Car-Joint Butts, Nos. 712, 714, 716.	60 %
Japanned Loose-Pin Butts, Nos. 726, 727, 728, 729, 730, 731	60 %
Japanned Loose-Pin Butts, No. 732	60 %
Strap and T Hinges, Nos. 910, 902, 904, 906, 908, 910	66⅔ %
Hinge Hasps and Staples, Nos. 912, 913, 914	66⅔ %
Crate Hinges and Hasps, Nos. 916, 918, 920	66⅔ %
Heavy T-Hinges, Braced Leaf, No. 922	66⅔ %
Solid Link Trap-Door Hinges and Hasps, Nos. 923, 923½	50 %
Light Strap Trunk-Hinges, No. 943	66⅔ %
Japanned Strap and THinges, Nos. 952, 954, 956, 958, 960, 962	60&5 %
Japanned Strap and T Hinges, Nos. 964, 966, 968, 970	60&5 %
Flush Bolts, Nos. 1000, 1001, 1002, 1004, 1005.	55 %
Flush Bolts, Nos. 1006, 1008, 1010, 1012, 1014.	55 %
Flush Bolts, Nos. 1020, 1022	60 %
Sunk Flush Bolts, Nos. 1030, 1034, 1036	50 %
Projecting Flush Bolts, No. 1038	50 %
Square Bolts, Nos. 1088, 1090, 1092, 1094, 1096	65&10 %
Square Bolts, No. 1098	65&10 %

Another Countryman Heard From.

SCENE—Country hardware store which deals in plumbing materials.
TIME—1889.
DRAMATIS PERSONÆ—Veracity, Keensent, Hasty & Co., Old Customer and Freighter.

Keensent: Hasty, won't you attend to that call at the "phone," I am busy?

Hasty: Hello! Who's this.

Old Customer: Old Customer. What's the bottom on sewer-pipe—large lot?

Hasty: Twenty-five per cent. off the list, net cash. How much shall we send you?

O. C.: I can beat that price badly. Have been offered it at 35 per cent. off.

H.: There must be some mistake about that. The trust controls the price of pipe and they require us to adhere to this price under penalty of forfeiting our agency. Can give you A1 goods but can't shade the price. You will find some error about your quotation, I feel assured.

O. C.: I ll see about it. All right.

H.: Hello there! We want that order for pipe, but we have given our word that we will hold the price, and Veracity will not agree to any deviation directly or indirectly. Who gave you better figures?

O. C.: Startem & Co. Is Veracity there?

H.: Yes.

O. C.: Call him to the "phone," please.

H.: All right. Here he is.

Veracity: Hello, Old Customer! What's the matter?

O. C.: Hasty says you can't shade 25 per cent. on sewer-pipe. Is that a fact?

V.: Yes. We can sell no better than 25 per cent. unless we forfeit our agency or, what is worse, break our word.

O. C.: You have always used me square, but I must look out for my own interests. Should be glad to give you the order at equal rates, but can't do it at 10 per cent. advance. That's all now.

V.: Hello! Are you sure that you can get reliable goods at less figures?

O. C.: So represented, and at 35 per cent. off.

V.: We have had a great deal of business with you and should be very sorry to lose so good a customer, but we cannot break our agreement, and in addition we cannot stack the goods in our yard at 35 per cent. off the list. The pipe costs us more than that in the yard.

O. C.: Well, I'll see. Good-by.

V.: Let us hear from you. Good-by.

(*Time*—1889. *Enter Freighter.*)

Freighter: Hello, Hasty! How is it about this sewer-pipe business? Old Customer has sent over to Startem & Co.'s, at Bounceville, and bought a lot of pipe at 35 per cent. off the list and contracted with Mule Driver to haul it. Now, I have drawn all the sewer-pipe for our own town until this lot and am sorry to lose the job. They say you claim that a trust controls the price and it can't be sold 35 per cent. off. How is it?

H.: Sorry, Mr. Freighter, but we can't give half of 1 per cent. better than 25 for an order of ten carloads.

F.: How can Startem sell at 35 per cent. off. They have got it all over town that you are trying to "Jew" us.

H.: Can't tell you, unless he has got hold of some inferior goods made by an outside party.

F.: Well, I thought that you and Keensent got there as early as any of them, but it seems that you are left. I am, too, for I have lost the job of hauling it and you don't give me any encouragement. Guess I shall have to start a team at Bounceville myself. Good-day.

(*Conference of the firm.*)

H.: How is this, Keensent? Old Customer has bought a lot of sewer-pipe of Startem at 35 per cent. off the list. Have you heard anything from the Universe Company lately?

K.: Not a word regarding change in price. Had a notice a few days ago that a Hew Harbor man got his agency taken away from him because he cut prices.

H.: I believe the trust has busted. Old Customer knows first-class pipe and he would not buy from Startem unless he got a better rate, and I have no doubt but that rate is 35 per cent., as he said.

V.: Keensent, have you watched the market closely on pipe?

K.: Why should I? A trust which assumes the control of retail figures would surely notify their agents of any change in rates the moment it was made, else it would brand itself as a traitor to its friends. If they fixed the wholesale price, but placed no restrictions on the retailers, the case would be entirely different.

H.: Keensent, you are left. Bet you a hat the combine is on its last legs and is going it regardless?

V.: Too fast, Hasty. The Universe Company is yet in existence. I had a letter from them only a few days ago regarding specialties and they say not a word regarding change in prices. I believe we shall find there is some mistake about this report. An honorable concern would certainly notify their agents of a reduction when they require them to sustain rates.

H.: Write them and see.

K.: I will do so at once.

(*A few days later.*)

K.: I have just received the Universe Company's reply. How's this:

Yours of the —th at hand and noted. We are able at the present time to make you a much greater discount than we were at the time you bought. We are pleased to say that at present we can name you a discount of 45 per cent. off the inclosed list and allow you freight in car lots, which will place you in a position to make a nice profit at 35 per cent. off the list. You are now privileged to sell at whatever price you see fit.

We trust this will be satisfactory and that we may have your orders. Very truly yours,

THE UNIVERSE COMPANY.

H.: Helen's babies! I would see them in Tophet before I would ever buy anyanother cent's worth of that combine or any member of it if I had to go out of the business.

V.: What did you write them, Keensent?

K.: Wrote them the facts and asked them to explain why Startem was able to sell at 35 per cent. off the list.

V.: This is astounding. Of all the loose transactions which has come to my knowledge this is the masterpiece. The Universe Company require their agents to adhere to a price named by themselves under penalty of forfeiture of the agency—fail to notify of a change in rates, and when called upon to explain, after an agent has lost trade by keeping faith with them, serenely reply, "Are pleased to offer at a price which will afford you a nice profit." Honorable men—unless they were too slipshod to do business—would notify their agents the moment a change took place. Had they placed no restriction on the retail price we should have been prepared for rate-cutting and could not have been led into such a false position. We could not take the agency for their goods without being more than morally bound to sustain their prices, and in turn they were bound morally, as well as upon honor, to notify and advise us of any change that we might protect ourselves.

K.: It would seem that business integrity and loyalty have no place in the vocabulary of trusts.

V.: Now, there is Old Customer. How can I convince him that I gave the facts as I understood them? How can he believe that a concern which requires their agents to sell at a fixed price would not notify them of a change? And yet these are the facts. We have lost his trade forever.

H.: Tell him that you were an ass and that I was another. I am going to soak my head.

V.: We will not put our trust in trusts hereafter. They are worse than princes.

Exposition of 1892.

A meeting of the Hardware interest was held at the rooms of the Hardware Board of Trade, November 8, at 2 o'clock, p.m. John H. Graham, who represents so efficiently the Hardware interests on the general committee, was chosen chairman and James H. Goldey secretary. A resolution was adopted selecting a committee for the Hardware and kindred interests to canvass for subscriptions for the Guarantee Fund of $5,000,000. This committee consists of the following gentlemen:

GUN TRADE	*Joseph H. Gales*
FOREIGN HARDWARE AND CUTLERY TRADE	*Chas. F. Wiebusch*
AMERICAN CUTLERY	*Eugene Bissell*
BRASS TRADE	*U. T. Hungerford*
AMMUNITION TRADE	*Wm. J. Bruff*
LOCKS AND BUILDERS' HARDWARE TRADE	*Wm. H. Jacobus*
WIRE AND WIRE GOODS TRADE	*G. G. Miller*
TIN AND STAMPED WARE TRADE	*David H. James*
METAL TRADE	*Russell W. McKee*
MACHINERY BUILDERS' TRADE	*John Lloyd*
JOBBING AND COMMISSION HARDWARE TRADE	*P. Le Coste*
PLATED-WARE TRADE	*Alonzo Alford*
STOVES AND RANGES TRADE	*J. D. Fraser*

The work of canvassing the trade has not yet been completed, and a statement of subscriptions secured up to date is deferred to a later issue.

Nail Extras.

Our attention has recently been called to an instance in which Cut Nails were sold by a jobber to a Hardware merchant which illustrates the awkwardness and undesirability of the present Nail card and the annoyance to which the jobbers and the retailer are liable to be subjected. In this case among other goods were the following charges for Nails:

5 kegs 16d Steel Nails	$2.35	$11.75
10 kegs 18d Steel Nails	2.60	26.00
Extra to average 25 cents over base 5	.25	1.25

This charge was not satisfactory to the purchaser, and on writing the jobber the following explanation was given:

We beg to say that manufacturers now quote us and sell us Nails at a stipulated price to average 25 cents per keg over the base price. If our order calls for base sizes the card advance on these sizes must be made up by this extra charge.

This rule has been generally adopted by the mills and we realize that jobbers will have to come to it sooner or later. When your order calls for a sufficient number of the smaller sizes to make up this average, of course you will understand that the extra charge is not made For instance, if we quote you Nails at $2.40 card rate and you take all base sizes we would lose money, for the reason that the mills now force us to make the average 25 cents over base, or if we fail they simply charge us up with the difference, as we did in your case. We would be glad to have an expression of your views on this subject. It is certainly very unsatisfactory to us.

The trade will recognize the difficulty of the situation and the inconvenience which arises from the arrangement of the card and the usage of the manufacturers in requiring that the extras on orders shall average 25 to 30 cents per keg. It would evidently be to the interest of all concerned if some system could be adopted which would obviate the necessity for having a specification of sizes before making a quotation, or of adding, as is usually done, an arbitrary charge, the object of which is to equalize irregularities in the card.

Items.

The Capitol Mfg. Company, Chicago, received orders for no less than 1700 dozen of their Acme Wrenches last week. Among these were orders from Italy, Germany, France, England and Australia and two orders by cable from London. They began the manufacture of the Wrench one year ago this month, and in January following shipped 250 dozen, which they regarded as very favorable progress. The increase in the demand since that has been of phenomenal growth, and has forced the company to erect a building especially adapted to their manufacturing business,

which they expect to occupy about December 1. They have also a new catalogue in press that will be ready for distribution by that time.

C. & W. McLean, St. Louis, Mo., under date 8th inst. issue a price-current devoted to Ammunition, Arms, &c., in which, without illustration, list-prices and discounts are given on many of the goods.

At a meeting of the Paint and Oil Club of New England, recently held in Boston, the subject of cartage was discussed. Customers have adopted the custom of refusing to pay for cartage, many of them deducting the amount charged for this service in bills and remitting the balance, and that the only way to overcome this habit of theirs was for the club to take united action and for each member to stand by an agreement not to make rebates of this kind.

The Hartman Hardware Mfg. Company, of Beaver Falls, Pa., have opened branch offices at 92 Chambers street, New York, and 70 Beverly street, Boston, Mass., where a full stock of their Wire Door-Mats and patent Steel Picket-Fence will be carried.

The United Glass Company, of Syracuse, N. Y., representing a consolidation of 19 Glass companies in Illinois, Indiana, Pennsylvania and New York, have established their main office at Chicago and will occupy quarters in the Auditorium. The president of the company is T. D. Catlin. He announces that Window-Glass is to be sold at prices which will shut out the foreign product, believing that the consolidation will work a sufficient reduction in cost of manufacture to enable this to be done.

Van Wagoner & Williams Company, 82 Beekman street, New York, issue a supplementary page illustrating their Gem Single-Acting Surface Spring Hinge. It is made in two styles, Real Bronze and Polished Brass. The list price on each of these is $6.

Surpless, Dunn & Alder, 97 Chambers street, New York, have been appointed agents for Hussey, Binns & Co., Pittsburgh, Pa., manufacturers of Shovels, Spades, Scoops and Post-Hole Diggers.

In connection with printed matter relating to their other manuractures the Standard Lighting Company, Cleveland, Ohio, send out large illustrated sheets describing their No. 2 and No. 3 Globe Incadescent Lamps. The No. 2 is described as having 320 candle-power. The No. 3 embodies the same construction applied to table-lamps. The different styles of these Lamps are illustrated.

The National Barrow and Truck Company, 82 and 84 Fulton street, New York, issue a circular describing their three-wheel Bristol Truck, a new article embodying special features.

We desire to call the attention of manufacturers to the special notice on page 54, in which the advertiser desires to form an engagement as manager of a Hardware manufacturing business or to represent a manufacturer in this city. From the prominent position this gentleman has held as manager of an extensive manufacturing business and his ability and wide acquaintance with the trade this opportunity is deserving the consideration of those who are desiring to form such a connection.

Gay & Parsons, Augusta, Maine, issue a circular describing the Maine Ice-Creeper, one of the advantages of which is that it can be worn on overshoes, rubbers or rubber boots, as well as on ordinary boots. It is fastened to the hollow of the foot and not on the heel or ball of the foot.

Hardware in Europe.

The following advices from the Sheffield corrrespondent of *Ironmongery* refer to the condition of the Hardware market in that section and indicate, it will be observed, the activity of trade and the firmness of prices:

The business position is rapidly assuming a more than active condition, and in the heavy branches of trade there are not wanting indications that the gradual and healthy expansion of the volume of trade during the past 12 months may merge into something like a "boom" and eventuate in a too rapid and extreme inflation of prices. The advances which have so far accrued have been by no means unnecessary, for the profits of capital and the wages of labor have been alike of an unsatisfactory character; the latter have now reached a higher and more general satisfactory level, and attempts are now being made, and naturally so, to secure for capital a fair return in the altered condition of things. Nevertheless it is possible to go too fast; and the wiser heads are delaying their action as long as possible and limiting their advances to the degree rendered absolutely necessary by the increased cost of production. This course is possible to those firms whose larger capital has enabled them to anticipate the course of the markets by "buying ahead," but it is difficult for firms otherwise placed to avoid the necessity of larger advances; hence a considerable disparity in quotations is noticeable in relation to precisely the same specification.

The following table has been compiled showing the advances in England during the past seven months from March to October. It will be perceived that in a number of goods moderate advances have been made:

Articles.	March, 1889.	October, 1889.
Anchors, 2 to 10 cwt.	11/9 cwt.	15/6 cwt.
Anvils, warranted...	23/ cwt.	25/6 cwt.
Basins, tinned, deep, 12-inch.....	2/6 doz.	2/10 doz.
Basins, galvanized, deep, 12-inch.....	3/6 doz.	3/9 doz.
Bellows, House.....	57½ %.	55 %.
Bolts, Tower.....	77½ %. -	72½ %.
Buckets, galvanized, 12-inch	5/9@6/6 dz.	7/@7/9 doz.
Castings, Three-Leg Pots, &c.....	7/3 cwt.	8/3 cwt.
Coil-Chain, ⅛-inch..	10/ cwt.	12/6 cwt.
Coffee-Mills, box....	62½ %.	57½ %.
Fry-Pans, bright....	77½ @ 80 %.	75 %.
Gas-Tubes.....	72½ %.	67½ %.
Cast Butts, light....	60 & 5 %.	55 & 5 %.
Patent Butts.....	67½ %.	65 %.
Hollow-Ware, cast, tinned.....	47½ %.	45 %.
Hollow-Ware, cast, enameled.....	35 %.	32½ %.
Wrought Nails, per list.....	50 %.	45 %.
Horse-Nails, per list..	55 %.	45 %.
Cut Nails.....	9/3 cwt.	10/9 cwt.
Cut Tacks.....	87½ %.	85 %.
Sad-Irons, common..	7/9 cwt.	10/ cwt.
Wood-Screws, Iron..	72½ %.	67½ %.
Spades and Shovels..	67½ %.	65 %.
Tin-Ware, Griffiths..	22½ %.	20 %.
Vises, Solid Box.....	30/ cwt.	31/ cwt.
Wire, Iron, 0 to 8...	7/ cwt.	8/3 cwt.
Copying-Presses.....	40 %.	35 %.
Garden-Rakes.....	50 %.	45 %.
Files.....	45@65 %.	40@60 %.

We also observe that Padlocks, Wire Nails, Brass and Copper Wire, Wrought-Iron Buckets, Tin-Ware, Galvanized Buckets, Pails, &c., have recently advanced, with the continuance of an active demand for Builders' Hardware, Edge Tools and other lines of goods.

Methods of Stock-Taking.

As the end of the year approaches the question as to the best methods of taking account of stock has additional interest and the progressive merchant will be on the lookout for any improvements that may be adopted. We have accordingly obtained information from a number of representative Hardware houses as to the principles they follow in this matter and the methods which have been approved in their experiences. On this point, as almost every other, there is a good deal of diversity of view and practice, which adds, indeed, to the interest of their advices. In the following extracts we indicate the States from which our correspondents write:

KANSAS.—We hardly think we can throw much light on the subject of an absolutely correct invoice, which shall include cost of freight, but gladly give such suggestions as come to us. We place the cost-mark on all goods received that are easily so marked, excepting, of course, Nails, Barbed and Baling Wire, Bolts, &c. The cost is to include freight, ascertained by marking each bill of merchandise with the amount of freight on same and taking the percentage of freight, boxing and drayage from net amount of invoice. This cost-mark is used as cost at inventory and the market price of goods that have cost-mark attached thereto varies but little. The Iron Stock, Wood-Work, Nails, Wire, Bolts, &c., we make invoice at reigning market prices and add actual freight rate per hundred-weight, less carload, which rate we always keep posted upon. Our stock is not extensive enough to warrant us in going into an exact inventory, but had we as large a stock think that freight on large or small shipments of the chargeable goods could be easily traced to actual cost though the medium of an account or record book kept for the purpose by the receiving-clerk or assistant book-keeper.

IOWA.—Our system is briefly this: All goods at current cash value at time of inventory (no matter what they may have cost when bought), actual freight on heavy goods, Nails, Iron and machines and 5 per cent. on shelf and similar goods, a percentage near enough for all practicable purposes of business, as we have found by comparing freight bills with their respective invoices. Your correspondent who criticizes the idea of spending 10 cents' worth of time to get at the exact value of 5 cents' worth of goods makes a good point against an over-nicety more common perhaps than the other extreme, "guessing it off," yet is hardly more practical, since at best an inventory is more in the nature of circumstantial evidence than proof of value, for are not the goods so carefully weighed, counted and priced subject to fluctuations in value that no man can determine beforehand, and as for the accounts, the good, the bad and the indifferent, do they not often jump from one list into the other quite beyond our expectations between the datings of our stock-taking in a way that sadly mars the result of our careful, painstaking and faultless inventory. Still, stock-taking in every business means duty. We know thereby better than without it the ins and outs of our business. We know better how much insurance to carry, know what we have, get it in better shape and together, and there is a little satisfaction besides in being able to guess thereby which way our profit-and-loss account balances for the year.

MONTANA.—We have not been able to devise anything new in stock-taking, doing ours as your correspondent indicates, and have to figure things all over, which is a tedious matter in a large and assorted stock. As to freight, we have to calculate it on each item of invoice, as on some goods, such as Cast Washers and others, the freight exceeds the first cost of the goods, and on Iron and Nails nearly equals first cost.

COLORADO.—We have been troubled, as have been your other correspondents, to reckon cost on discount goods with freight added where freight is so prominent a factor as it is with us, and we have as yet found no system that will invariably apply. In Carriage-Bolts, for instance, the pro-

portion of freight to list will vary with every size Bolt. To rectify this as far as possible we inventory each diameter at a different discount, varying from 70 and 5 per cent. on ¼ inch to 60 and 2½ per cent. for ⅝, and these discounts we base on the medium length. Screws we find to vary fully 7 per cent. on extreme sizes. In nested Stamped Ware we find large variations. Rinsing-Pans will cost 6 per cent. more than Dairy by reason of extra freight on boxes; and when it comes to goods that won't nest at all, we simply lay down our pencils and guess. We have found no remedy for this and with few exceptions have made net lists of our own. There is, however, one system we use which your readers might possibly find useful, and we are not certain it might not be amplified to cover more ground. Where freights vary, as they sometimes do, or where we wish to compare a price at a given discount in one place with a less discount at a point where freight is less, we adopt as a unit 1 cent per pound and find what per cent. of the list that is, and this forms the basis from which calculations can quickly and accurately be made. For instance, we find that 1 cent per pound is 5 per cent. of the list in a certain line of goods on which the discount is, say, 60, 10 and 5 per cent. If we pay 150 per 100 pounds of freight, we at once see the freight is 7½ per cent., which, deducted from the base discount, leaves cost 52½, 10 and 5 per cent. This plan would seem to cover the ground he instances in the case of the line of Sargent's goods; but his Butts, Casters and Brackets are still refractory and must be taken out of the general category and individually treated so far as we can see.

MICHIGAN.—Our method for taking account of stock is as follows: We have books of uniform size from each department separate, which gives us a correct knowledge of the amount in each class of goods. In heavy goods, such as Iron, Nails, China and Glass, we add the freight to each class on a basis of percentage, having the classification-sheet and rate for freight. We can also arrive at the rate on shelf goods in the same manner. We have pursued this course for the past five years and find it a satisfactory way.

MINNESOTA.—I take stock once a year, between the 25th and 31st of December, so as to know in what shape I commence the year. I always add 10 per cent. to all goods when they arrive except heavy goods, such as Nails, Barb-Wire and Sheet-Iron. These I always invoice at net market price at time of invoice. Other shelf goods do not change enough to make it necessary to take market prices on small assortment. Jobbers and large retailers in cities where change of markets affects these prices up and down must take market prices as a basis, with freight and other expenses added. I may be wrong, but I think goods are actually worth what it costs to buy them, with freight and expense of handling them added.

MONTANA.—Being at a distance from markets cuts such a large figure in the cost of most of our goods that we have been compelled to give the matter considerable attention. It occurs to us that rules that apply and are necessary to us would not be applicable to firms doing business close to a market where freight is a small item compared with cost of goods. We find it impracticable to add to invoice-price of goods any percentage to cover freights, for the reason that the values and weights of any single line of goods vary so greatly. To illustrate this take a line of Pipe Fittings or Brass Goods; the values and weights are widely apart and the entire line will not bear a uniform charge. For this reason we weigh and mark all our goods at actual and individual cost. We have a stock-book which shows invoice cost and weight of all articles, also amount of each of the goods added to stock each day and amount sold each month. By this system we tell what we need of any particular article. In the event of a seller offering us, say, 10 or 100 dozen and making for the same a special discount we can tell whether we need to take advantage of the special or whether the purchase would be for a long time a dead stock. As to stock-taking at the end of the year, it is at best a tiresome business; we always take at actual value, having the weights on our stock-book and making necessary changes in discounts. This we follow in our principal lines. It is not practicable on small shelf goods, upon which we have quite a margin and which will certainly realize more than cost. Another matter we endeavor to bear in mind is that the invoice price of goods with freight added when delivered to our store does not represent the true costs of the goods when delivered to our customer. To sell these goods we have a large investment in real estate, clerk hire and many other expenses. Hence an article that really costs us $1 to deliver in the store may cost $1.10 to sell it. This is a matter, however, that we only consider in marking a selling price on goods. We make the close of the year, December 31, our time for ascertaining our condition. In order to get our inventory we commence same, say, December 1. We then put a memorandum on every package and keep a stock memorandum of goods sold from packages taken between December 1 and December 31. These we deduct from inventory December 31. If inventory is not completed, say, to January 15 we add the goods sold after December 31.

Enterprise in Selling.

We have already directed the attention of manufacturers to the desirability of supplying their customers with circulars, leaflets and other printed matter relating to their goods and to be used in promoting their sale. In the letter printed below the point is, however, made by the manufacturer that such circulars, if supplied, are very likely to be unappreciated and unused by the merchant, while at the same time it refers to the advantage the retailer might gain by the proper use of such advertising matter supplied him by the maker of specialties. Referring to this matter our correspondent says:

Being the manufacturer of a line of goods on which the margin is too small to admit of general newspaper advertising to the consumer, I can only make use of the trade papers to notify the trade and then furnish the retailer a liberal supply of show-cards, circulars, &c. The natural supposition would be that after buying and paying for goods the dealer would at least try to sell them and get his money back and to that end would utilize the "silent salesmen" supplied by the manufacturer. Yet how often you will find the circulars thrown into the waste-paper, the signs or show-cards ditto, and the goods stuck back on some dark shelf "out of the way," and then when some time passes, and on taking inventory the dealer finds the goods all on hand, he at once declares them no good and the manufacturer a swindler for imposing on him goods that won't sell. Now, to practically illustrate this article, how much more sensible he would be if (taking my line of goods as an example) he would hang up the little show-card where someone could see it, put a can of Nubian on the show-case with a few circulars, so that if anyone seeing the can should be interested he could take a circular and read it without bothering the store-keeper or his clerks to explain "what's this for?" Or at this season of the year take a joint of common stove-pipe, coat it with Nubian, set it in the window or outside, hang a Nubian sign on it, or if someone in the store is handy with a marking-brush (and right here let me say that if not, someone ought to practice) print a sign saying: "This is coated with Nubian;" the dealer will be surprised to find how many will come in and say: "That is just what we want for our grates and mantels." Many new customers will be attracted to whom other goods can be sold. I have illustrated the points I wish to make by speaking of the plan as adapted to my own line, because on this line I am somewhat better posted, but the plan is applicable to hundreds of other lines, and many a dealer would find trade good and growing if he would wake up and utilize the "silent help" given him by the manufacturer, instead of holding down a chair or nail-keg and blaming the powers that be for dull trade Nearly every store-keeper has a rubber stamp. In dull hours let some clerk stamp all circulars with his name, and when sending out parcels of any kind put in a couple of circulars of different kinds. Very often they will fall into the hands of someone who is in want of the very thing advertised and a customer will be gained without cost to the merchant.

Exports.

PER BARK RUNNYMEDE, OCTOBER 10, 1889, FOR ADELAIDE, AUSTRALIA.

By Healy & Earl.—6 cases Forges.
By Mailler & Quereau.—2 cases Forks, 168 dozen Handles, 36 dozen Wash-Boards, 52 packages Carriage-Ware.
By R. W. Forbes & Son.—2½ dozen Whip-Stocks, 3 cases Hardware, 223 pounds Axle-Grease, 13 cases Hardware.
By E. Miller & Co.—30 packages Lamp-Goods.
By Rogers, Smith & Co.—7 boxes Plated-Ware.
By R. Irvine & Co.—2 boxes Wire Goods.
By Barden & Ackerman.—1 case Plated-Ware.
By Russell & Erwin Mfg. Company—5 packages Hardware.
By Coombs, Crosby & Eddy.—8 cases Wringers.
By Sargent & Co.—2 barrels Cow-Bells, 2 cases Hardware.
By Fairbanks & Co.—21 boxes Scales.
By McLean Bros. & Rigg.—4 dozen Wrenches, 3 dozen Wrenches, 8 packages Carriage-Ware, 3 cases Hardware, 1 dozen Coffee-Mills, 1 case Lamp-Ware, 16 dozen Axes, 3 dozen Braces, 2 dozen Wrenches, 1 dozen Mangles, 2 dozen Locks, 44 dozen Axes, 3 dozen Forks, 4 Drills, 2 dozen Cork-Pullers.
By Arkell & Douglas.—5 cases Bolts, 13 packages Pumps, 21 packages Granite Iron-Ware, 50 packages Stoves, 20 packages Lamp-Ware, 25 packages Grindstone Fixtures, 16 packages Mowers, 4 crates Wheels, 49 bundles Wash-Boards, 73 cases Wringers, 140 cases Axes, 97 packages Hardware, 3 cases Handles, 8 cases Wringers, 2 boxes Axes, 1 case Castings.
By H. W. Peabody & Co.—12 packages Hardware, 3 cases Lamp-Ware, 1 case Mattocks, 1 case Wagons, 9 cases Castings, 2 cases Perambulators, 7 cases Agricultural Implements, 25 packages Lamp-Ware, 500 Handles, 36 dozen Handles, 1 case Castings, ½ dozen Wringers, 1 case Perambulators, 2 cases Lamp-Ware, 22 bundles Barrows, 1 case Traps, 4 packages Carriage-Ware, 28 cases Perambulators.
By W. H. Crossman & Bro.—175 gross Lead-Pencils, 2 cases Plated-Ware, 12 dozen Thermometers, 3 gross Lead-Pencils, 1 case Plated-Ware, 1 case Hardware, 4 Pumps, 1 dozen Barrows, 333 pounds Stones, 6000 Cartridges, 3 Sad-Irons, 1 box Hardware.

PER BARK HARRIET S. JACKSON, OCTOBER 31 1889, FOR EAST LONDON, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—2176 pounds Rope, 8 Plows.
By Arkell & Douglas.—12 Shellers, 10 Shellers, 8 Plows, 10 dozen Hatchets, 8 Washers, 10 Ranges, 10 dozen Hatchets, 18 dozen Hardware, 2 Bolt-Clippers, 6 dozen Plows, 80 dozen Handles, 6 Hardware, 3 Scales, 4 dozen Hardware, 1 case Springs, 48 dozen Handles, 64 dozen Axes and Hatchets, 1 Evaporator, 200 Plows and Parts, 1 dozen Saws, 4 dozen Whip-Sockets, 48 gross Hardware, 3 dozen Tools, &c., 18 Churns, 2 dozen Saws, 9 cases Washers and Wringers.
By W. H. Crossman & Bro.—327 cases Plow-Parts, 2 dozen Barrows and Parts, 10 Corn-Shellers, ½ dozen Corn-Mills, 220 cases Plow Parts, ½ dozen Corn-Shellers, 1 Carriage, 50 dozen Hatchets, 20 dozen Axes, 5 dozen Churns, 1500 feet Hose, 100 dozen Handles, 1 dozen Step-Ladders, 7500 pounds of Nails, 10 dozen Lawn-Sprinklers, 83 Stoves, 4 cases

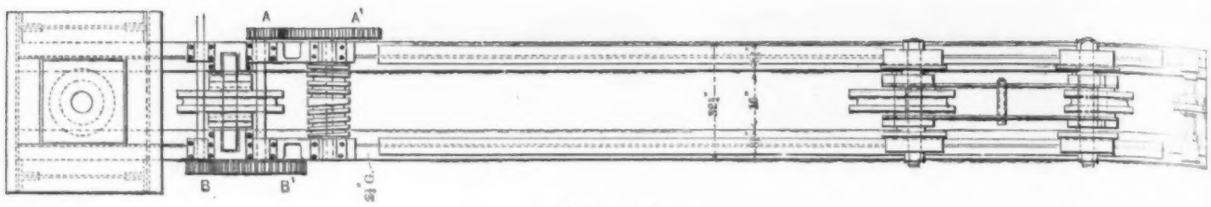


FIG. 2, PLAN

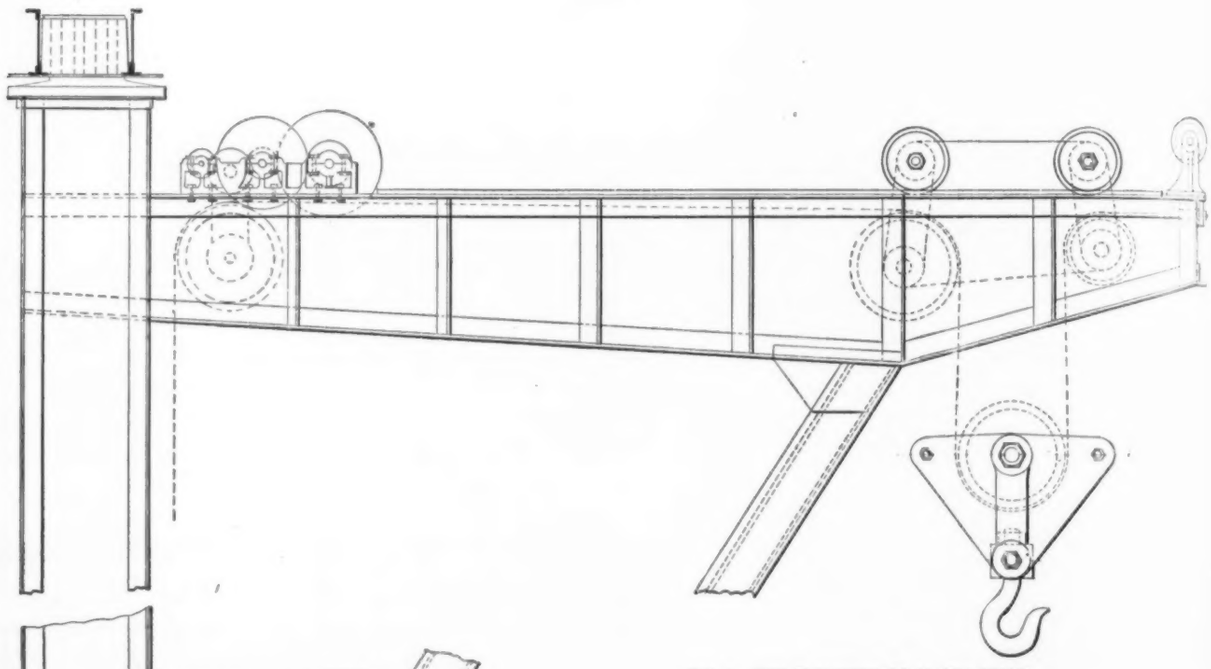
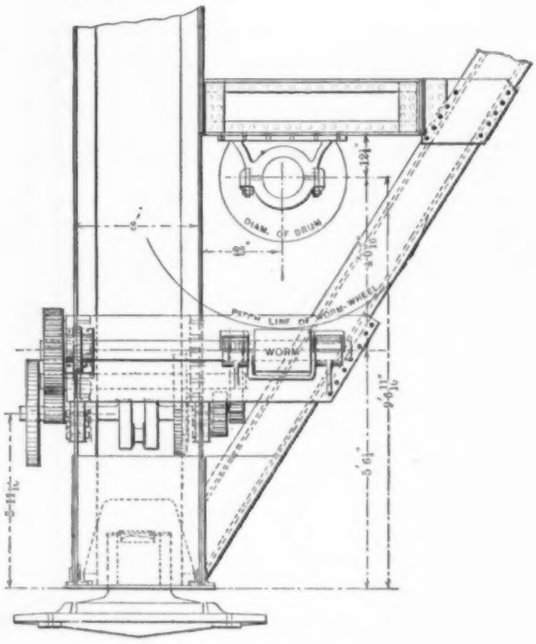


FIG. 1.—SIDE ELEVATION OF 80-TON CRANE.



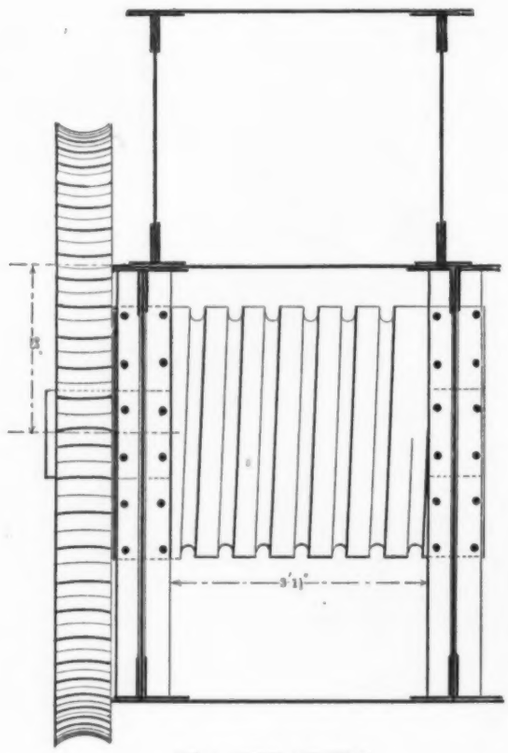


FIG. 4.—DRUM AND GEAR.

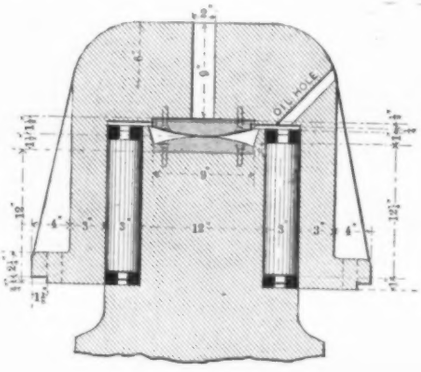


FIG. 3.—STEP OF CRANE.

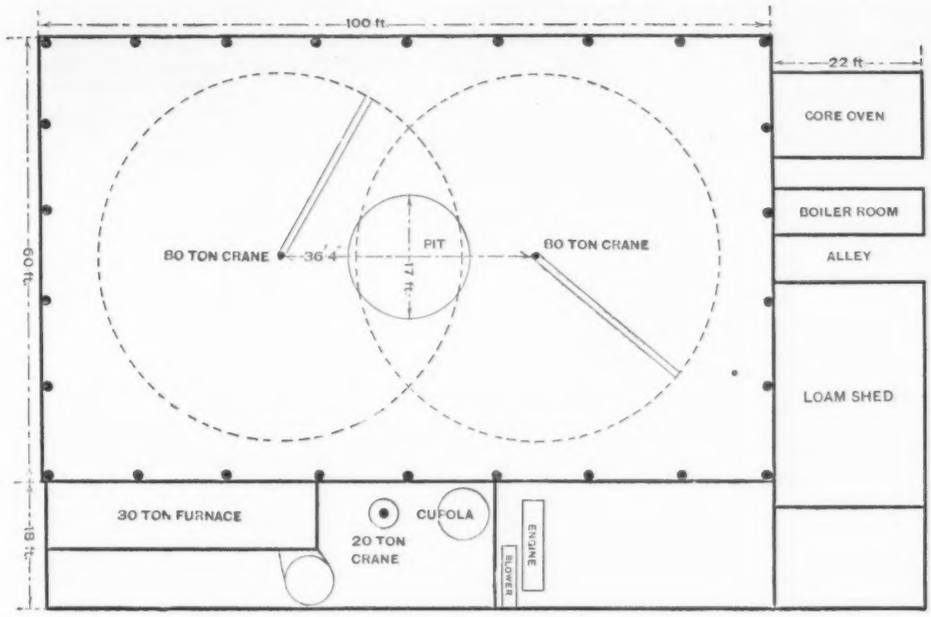


FIG. 6.—PLAN OF FOUNDRY.

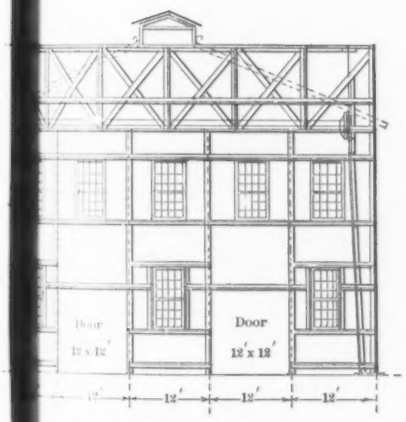


FIG. 7.—END ELEVATION.

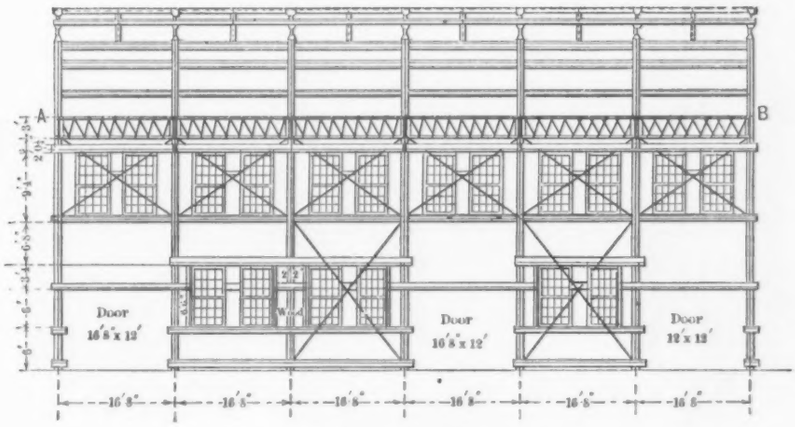


FIG. 8.—SIDE ELEVATION.

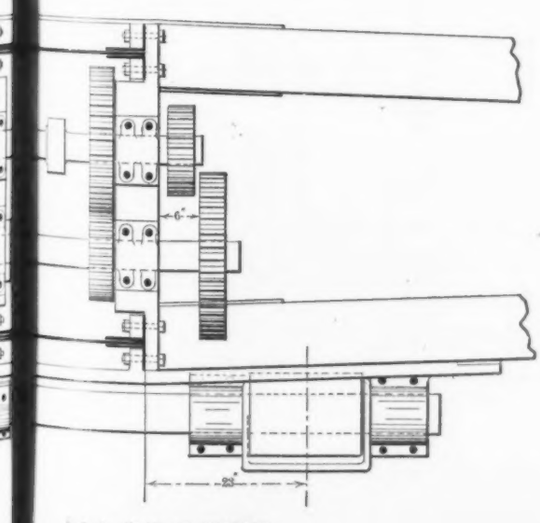


FIG. 5.—PLAN OF GEARING.

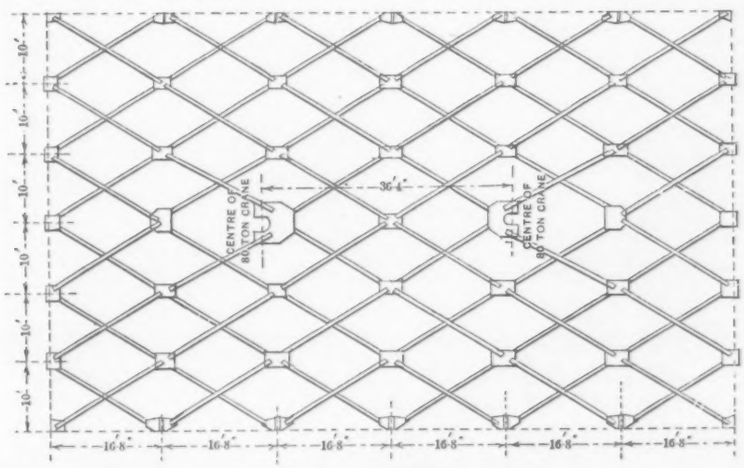


FIG. 9. PLAN OF LATTICE BRACING OF ROOF.

Stove Parts, 19 cases Tin-Ware, 5 Scales, 1800 pounds Sash-Weights, 33 pounds Sash-Cord, 20,000 pounds Barb-Wire, 20 dozen Hatchets, 1790 pounds Sash-Weights, 41 pounds Sash-Cord, 52 crates Ranges and Parts, 34 Scales, 1 dozen Perambulators, 12 packages Carriage-Ware, 6 sets Axles, 1 case Hardware, 28 crates Ranges, 3 cases Plow Parts, ½ dozen Churns, 11 packages Carriage-Ware.

PER BARK ST. MARY, OCTOBER 30, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By E. Kuhn.—7 cases Axes.

By Corner Bros. & Co.—5 cases Hardware, 2 cases Agricultural Implements, 4 dozen Picks, 13 cases Agricultural Implements, 40 dozen Axes, 3 dozen Pumps, 6 cases Agricultural Implements.

By J. Norton & Sons.—200 dozen Pick Handles, 200 dozen Padlocks, 60 dozen Axe Handles, 187 Meat Cutters, 7 dozen Meat-Cutters, 20,000 Metallic Cartridges, 1 dozen Saws, 40 dozen Hatchets, 10 dozen Axes, 12 dozen Spade-Handles, 12 dozen Stencils, 35,450 pounds Agricultural Implements.

By Arkell & Douglas.—1 case Bells, 500 Handles, 68 pounds Wire, 1 case Tacks, 6 dozen Rakes, 2000 Handles, 1 case Plow Parts, 17 dozen Carriage-Ware, 500 Handles, 1 package Nails, 18 Nests Cages.

By R. W. Forbes & Son.—1 dozen Rakes, 16 packages Tools, 1 box Drills, 1 dozen Forks, ⅓ dozen Braces, 4 cases Plows, complete, 1 package Plated-Ware, 1 dozen Hoes, 1 case Hardware, 2 crates Corn-Mills, 3¾ dozen Balances, ½ dozen Scales, 2 packages Hardware, 1½ dozen Meat-Choppers, 1 case Saws, 5 cases Hardware, 15 dozen Handles.

By Coombs, Crosby & Eddy.—10 dozen Spades, 1101 pounds Rope, 1097 pounds Rope, 20 dozen Handles, 35 dozen Edge Tools, 420 pounds Scales, 30 dozen Handles, 675 dozen Agricultural Implements, 3 cases Hardware, 2723 pounds Agricultural Implements, 14 dozen Edge Tools, 24 cases Plow parts, 157 pounds Scales, 1 dozen Spades, ¾ dozen Wringers, 2 packages Scales, 197 pounds Scale-Beams, 4 Saws, 16 dozen Hardware, 496 sets Plow Parts, 20 dozen Picks, 70,000 pounds Wire, 22,500 pounds Nails, 3886 pounds Plow Parts, 804 pounds Corn-Shellers, 900 pounds Plow Points, 566 pounds Scales, 5 dozen Edge Tools, 22 dozen Handles, 18 dozen Hard ware, 6 dozen Hoes, 12 dozen Hammers, 148 pounds Sash-Cord, 12 dozen Handles, 22 dozen Hardware, 1 Pump, 10,000 pounds Barb-Wire, 65 dozen Hardware, 15,000 pounds Nails, 4907 pounds Store-Trucks, 24 Trucks, 20 dozen Tools, 5 dozen Barrows, 75 dozen Handles, ⅓ dozen Scoops, 10 dozen Forks, 685 pounds Plows.

PER SHIP ENDORA, NOVEMBER 4, 1889, FOR MELBOURNE, AUSTRALIA.

By Strong & Trowbridge.—12 dozen Axes, 3 dozen Saws, 6 dozen Picks, 1 case Mouse-Traps, 2 cases Carriage Castings, 4 cases Carriage-Bolts, 2 cases Axles, 2 cases Axles, 1 case Nails, &c., 1 case Hardware, 2 cases Carriage Castings, 2 cases Axles, 1 case Nails, 1 case Nuts and Bolts, 2 cases Carriage Castings, 1 case Hardware, 1 case Castings, 4 dozen Picks, 5 dozen Hammers, 2½ dozen Wringers, 2 dozen Manure-Forks, 2 cases Locks, 4 dozen Wrenches, 1 case Rivets, 35 kegs Nails, 2 cases Castings, 2 cases Pumps, 1 cask Pumps, 3 cases Choppers, 1½ dozen Saws, 1 gross Rat-Traps, 4 cases Tools, 2 cases Meat-Cutters, 15 dozen Axes, 2 cases Locks and Keys, 1 case Hardware, 2 cases Carriage Castings, 1 case Nails, 12,000 Cartridge-Shells, 1 case Gun Parts and Wads, 3500 Cartridges, 1400 Cartridge-Shells, 1 case Fire-Arms and Tools, 9700 Cartridges, 1 case Gun Parts, Tools, &c., 1 case Targets, 1 case Sporting Goods, 3 cases Bolts, 1 case Axles, 1 case Carriage Castings.

By W. H. Crossman & Bro.—2800 pounds Nails, 37 Pumps, 10 dozen Whip-Sockets, 2½ dozen Lamps, 1 case Hardware, 35 dozen Axes, 14 dozen Broilers, 144 dozen Handles, 12 dozen Hatchets, 4 dozen Potato-Hooks, 21 gross Fish-Lines, 17¼ dozen Bells, 6 dozen Hammers, 5 gross Axle-Grease, ¼ dozen Sad-Irons, 12 packages Hardware, 1 barrel Lamp Goods, 6 dozen Handles, ¼ dozen Sad-Irons, 10 dozen Spades, 2 dozen Bush-Hooks, 40 dozen Axes, 1 dozen Wringers, 6 dozen Sifters, 3 dozen Mincers, 12 dozen Lamps, 3000 Metallic Cartridges, 14 dozen Sad-Irons, 2 dozen Axes, 12 dozen Spades, 6¼ gross Axle-Grease, 45 packages Hardware, 1 dozen Wringers, 1 dozen Wringers, ¼ dozen Sad-Irons, 1 gross Egg-Beaters, 6 dozen Traps, 1 dozen Corkscrews, 2 dozen Carpet-Sweepers, 1 keg Hardware, 4 dozen Wire Mats, 3 dozen Traps, 8 cases Hardware, 17 cases Handles, ¼ dozen Sad-Irons, 1 case Hardware, 9 packages Pumps and Parts, 1 box Hardware, 2 dozen Lawn-Sprinklers, 2 Refrigerators, 10 cases Hardware, 15 Bolt-Cutters, 7152 pounds Iron Bolts.

By Plumb, Burdict & Barnard.—8390 pounds Iron Bolts.

By J. McEwan & Co.—7 cases Hardware.

By Coombs, Crosby & Eddy.—3 Boilers, 1500 pounds Machinery, 6 dozen Mouse-Traps, 3 dozen Handles, 18 dozen Hammers, 24 dozen Traps, 1 gross Polish, 18 dozen Axes and Tools, 2 dozen Wringers, 9 dozen Fly-Traps, 719 pounds Nails, 30 dozen Springs, 7 dozen Hardware, 106 dozen Washita Stones, 1½ dozen Grindstones, 6 reams Flint-Paper, 115 dozen Hardware, 1 case Hardware, 24 dozen Handles, 5 dozen Stencils, 18 dozen Handles, 30 dozen Lawn-Mowers.

By R. W. Cameron & Co.—17 cases Hardware, 6 cases Axles, 37 cases Handles, 4 cases Hardware, 15 cases Hardware, 1 case Sawmill Machinery.

By W. & B. Douglas.—88 Pumps.

By C. B. Rogers & Co.—2995 pounds Machinery.

By Meriden Britannia Company.—4 packages Plated-Ware.

By P. D. Ackerman & Bro.—2 cases Plated-Ware.

By Yale & Towne Mfg. Company.—354 pounds Hardware.

By Rogers, Smith & Co.—16 packages Plated-Ware.

By Russell & Erwin Mfg. Company.—12 cases Hardware.

By Welsh & Lea.—40 cases Axes, 5 cases Iron Bolts, 1 bundle Hardware.

By Woodhouse & Stortz.—1299 pounds Hardware, 8 Stoves, 230 pounds Stove Castings.

By W. K. Freeman.—726 pounds Horse Nails, 9 packages Lamp Goods, 6 cases Hardware, 118 pounds Hardware.

By Welsh & Lea.—26 cases Hardware, 16 cases Handles, 2 crates Stone, 1 case Plated-Ware, 1 case Forks.

By F. B. Wheeler & Co.—9500 Bolts, 23 cases Hardware, 20 dozen Whip-Sockets.

By H. W. Peabody & Co.—12 cases Hardware, 210 dozen Tools, 40,340 pounds Barb-Wire, 34 dozen Handles.

By Healy & Earl.—11 cases Mill Machinery, 3 cases Wood-Working Machinery.

By A. S. Lascelles & Co.—9 cases Plated-Ware, 51 cases Handles.

By A. Field & Co.—25,000 Bolts, 5 cases Carriage-Ware, 60 dozen Whip-Handles, 2400 Axle-Grease, 10 cases Carriage-Ware, 50 dozen Whip-Handles, 12 gross Whips, 6 dozen Saws, 5 dozen Hardware, 19 gross Hardware, 5 dozen Hatchets.

By Mailler & Quereau.—36 dozen Handles, 1 case Wringers, 1 case Drills, 4 cases Tools, 1 case Sand-Paper, 11 cases Nails, 38 kegs Cut Nails.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Very little change has taken place in this department during the past week. Business has been of quite good volume in most departments, running fully up to that of last week, as a rule, yet operations have in no instance extended beyond ordinary bounds, nor reflected alteration in the position of supplies or in the tendency of values. Briefly, it is an even, steady market all around, as far as business from first hands may be concerned, and evidence is wanting of any disturbing influences in the jobbing department.

The Lead corroding works of Armstrong & McKelvy, Pittsburgh, Pa., have been absorbed by the National Lead Trust. The only firms now out of the trust are Gebhard & Co., Dayton, Ohio; Suydam & Co., Allegheny, Pa.; the Eagle Company, Cincinnati, Ohio; Carter Company, Omaha; Maxwell Company, Chicago; Standard Company, New York City. The latter are a new company, and will probably have their Lead on the market next week.

White Lead.—There has been a very good trade during the week, and manufacturers assert that their deliveries are up to the full average volume for the season. No change has been made in prices at first hands, and jobbers continue to sell at the net prices heretofore quoted.

Zincs.—American Oxide has met with very fair sales for prompt delivery, and some further contracts have been made for 1890 delivery. Prices remain without change. In foreign Zincs there has been about the usual trade and prices are without change.

Colors, &c—The general market for dry Colors has shown a fair degree of spirit, some fairly liberal transactions in grinders' materials being reported, while the distribution of painters' Colors has run a little larger this week than last in some instances. Prices show little change and are steady as a rule.

Miscellaneous.—Barytes continue very firm, being in light supply and fairly active demand. Best brands of Whiting are firm and selling on the basis of 49¢ for Common, but others go at 2½¢ @ 5¢ under that price. Paris White continues to meet with very good sale, and both Cliffstone and American are steady at former prices.

Animal and Vegetable Oils.

The principal events in this line have been a further decline in prices for Cotton-Seed-Oils and an advance on Whale-Oils, the former being due to a continued sharp competition between trust and anti-trust producers, and the latter to unfavorable reports as to the results of the last whaling season. Both commodities have been fairly active. On the balance of the list no important changes have taken place in prices, and the general situation is much the same as it was a week ago.

Cotton-Seed-Oils.—Upward of 2000 barrels crude Cotton-Seed-Oil have been sold in this market during the week at 28¢ @ 29¢ for prime quality, with the largest and latest transactions at the lower price. The movement of refined has been only fair and at about 1¢ decline from last week's bottom figures.

Linseed-Oil.—The position of the market is about the same as noted last week. Crude material continues high and arrivals of out-of-town Oil moderate, leaving the local market practically to city crushers and enabling them to hold prices firmly. The demand has continued moderately active.

Lard-Oil.—Prices have varied in a very moderate way only and the position is not perceptibly changed. Some pressers report an active business for the week, but as a rule business appears to have been only fair.

Whale-Oil.—Several lots of crude Oil have been purchased in the New Bedford market, leaving but one lot in first hands, for which 45¢ is asked. Supplies of manufactured Oil are moderate and prices for the same have been advanced 1¢ ₱ gallon.

Sperm-Oils.—Crude has been sold to a fairly liberal extent at 63¢ in New Bedford. That price is now bid and 65¢ asked, showing a stronger market. No change has been made on the manufactured Oils, but an advance soon is considered probable.

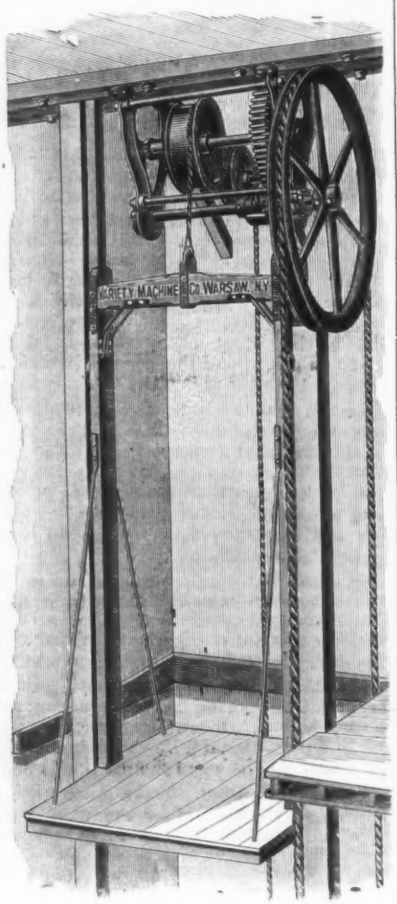
Menhaden-Oil.—The entire Barren Island stock of Crude has been sold for export, and it is estimated that, despite the heavy catch of fish during the season, only 5000 to 6000 barrels remain in first hands. At the present time there is a fair export demand at previous prices. Pressed and Bleached and Tanners' Oils are steady at previous prices.

Cocoanut-Oils.—There have been quite heavy arrivals of Ceylon and Cochin product, but the greater portion was sold previous to arrival, and prices for spot goods have undergone but little change.

Olive-Oil.—Italian Oil in barrels is a shade firmer and has met with rather larger sale, chiefly at 72¢, in moderate-sized lots.

The Variety Hand Elevator.

The hand elevator represented herewith is manufactured by the Variety Machine Company, Warsaw, N. Y. It is designed to carry freight or passengers weighing up to 1000 pounds. Special attention is directed by the manufacturers to the clutch, which embodies a neat mechanical device, and by its use the elevator is held at any point without the use of a brake. This elevator may be operated by any one, the car stopping when hand-rope is released, whether going up or down, with or without load. The shafts run, it is stated, in steel roller-bearings, thus reducing friction to a minimum. The machinery is compact and is fastened together substantially in an iron frame. The elevator is furnished



The Variety Hand Elevator.

complete, with hard-wood guides, hand-ropes, sheave and counter-weights, &c., and the manufacturers claim that it can be set up by any mechanic, or they will bid on putting it in. The car is made any size up to 5 feet square. A safety attachment is put in when desired at small additional expense. The low price of this elevator and its easy operation are points made in regard to it.

Crosby's Patent Ash-Sifter.

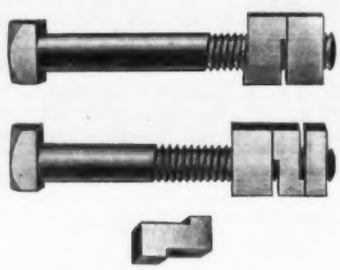
The accompanying illustrations represent this article, which is manufactured by the inventor, Joseph E. Crosby, Westfield, N. J. It will be observed that a perspective view indicating the use of the sifter is given, and also a sectional view showing position during the process of sifting. It will thus be seen that the sifter consists of an ash-box or receptacle and a sieve-box about half the length of the ash-box. This sieve-box is hinged to the top of the ash-box at a point about midway between the ends, so that it can be raised on its hinges so as to rest upon one end of the ash-box, as shown in the large cut, or it may be turned over the other end of the ash-box, as shown in the small cut, thus closing the ash-box. Within the sieve-box is located a sieve or sifter of cylindrical shape, the lower end of which is closed by a disk or head, the construction being such that it is revolved

Crosby's Patent Ash-Sifter.

by means of the handle shown in the illustration. In use the ashes to be sifted are placed in the sifter in the circular ash-pan, the ash-pan remaining in the sieve and resting on the bottom thereof. The end is then closed down and hooked in place and the sieve-box turned over on the ash-box, thus closing all openings which might permit the escape of dust or ashes. The sieve is then revolved by means of the crank and the rotary motion turns the ashes down out of the ash-pan and into the ash-box, whereby they can be removed at will through the hinged door in front. It is explained that when the sieve-box is turned down, bringing the sieve into a horizontal position, the ash-pan will remain against the bottom of the sieve. After the process of sifting is completed the apparatus is allowed to stand for a few minutes in order to permit the dust to settle, when the sieve-box is raised, bringing the sieve to a vertical position, when the coals fall back into the pan, which can then be removed. An ash-pan is furnished with each sifter. The manufacturer calls attention to the advantages of this sifter, no dust whatever being connected with the sifting of the ashes, especially in view of the fact that it is not necessary to empty the ashes into the sifter We are advised that this sifter can be used without the least escape of ashes.

Edgar's Universal Nut-Lock.

John Edgar, Rochester, Minn., is manufacturing the nut-lock represented in the accompanying illustrations, the construction of the device and its use in connection with a nut being indicated. It will be perceived that the invention consists of two nuts, a primary with projections or shoulders on its faces and diagonally opposite and a secondary or common nut. When screwed in place, as shown in the cut, one shoulder of the primary nut bearing on the substance held on the bolt causes that nut to tilt or clamp on the bolt, while the other shoulder bearing on the common nut causes it to tilt or clamp in the opposite direction, the two nuts thus pressing, one against the inner side and the other against the outer side of the bolt-threads and against each other. It is obvious, therefore, that a very powerful grip on the bolt is secured, and the manufacturer mentions that the lock has been subjected to severe tests with uniformly satisfactory results. It is suggested that the secondary nut may be thin, though any ordinary nut will do, and it should not be screwed so tight as to strain the bolt. It can in some cases be pressed tight enough with the fingers. The nuts can be tapped loose and run on free, saving much time in close or confined places, or where a great many nuts are used. The device may be used on a loose or free bolt or one that needs to play endwise, as well as on any other. The nuts run together and will hold anywhere on the bolt-thread and need not bear against the substance on the bolt. When the primary nut bears against the substance on the bolt a side pull is given to the bolt. When this would be an objection and when the full face bearing of the nut is required a common nut should first be run on, the nut device following, in which case both the primary and secondary nuts may be thin. The utility of this invention in places where nuts become loose and make trouble as well as its simplicity and durability are points to which attention is directed by the manufacturer.

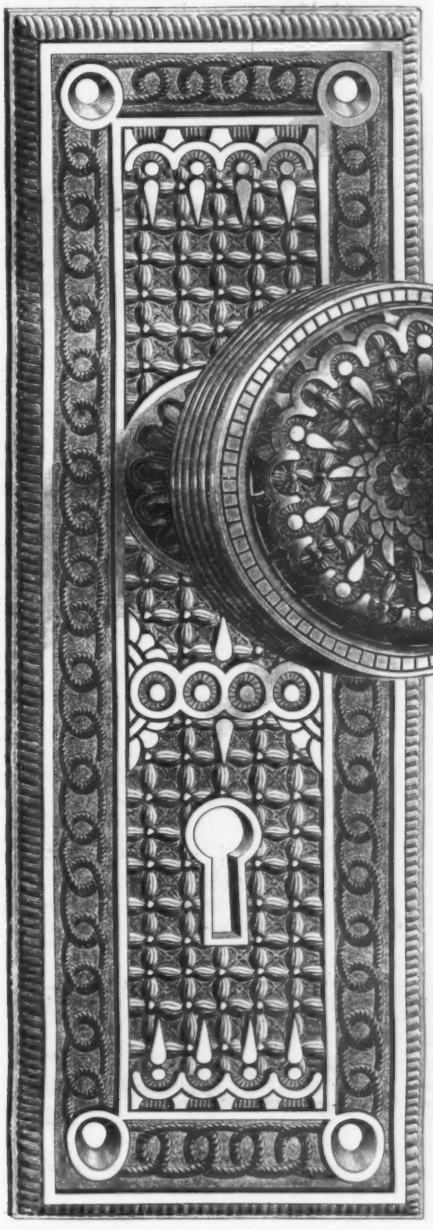


Edgar's Universal Nut-Lock.

The A. J. Harwi Hardware Company, Atchison, Kan., have moved into their new store, corner Seventh and Commercial streets, where, we are advised, they have better facilities than ever before to supply their trade with shelf and heavy hardware, tin and granite iron-ware, iron wagon material and wagons and buggies.

Elaine Design Lock Trimmings.

In connection with the marked tendency toward the production of artistic hardware we illustrate herewith the Elaine design, which has been patented by Reading Hardware Co., Reading, Pa., and 81 Reade street, New York. This design, which will be recognized from the cut as exceptionally tasty and artistic, is applied by them to a line of locks, knobs and other related hardware, as shown in their catalogue devoted exclusively to these goods. This design is furnished in different styles



Reading Hardware Company's Elaine Design.

of finish, among which the Hecla bronze, which has a steel-gray background, is referred to as by far the handsomest and most striking. It is also furnished in chocolate bronze, which has a chocolate-colored background, in gold bronze which has a bright colored background, and in royal bronze, which has a black background. The catalogue of the company which represents this line of goods is deserving the attention of the trade from the completeness of the line and the elegant printing, which shows the goods off to excellent advantage, although the illustrations are given without color and fail to represent the beauty and striking effect of the goods themselves. We are advised that the full line of hardware of this design, although only recently put on the market, has proved very popular with the trade and architects, and several large public buildings have been furnished throughout with the Elaine design.

The Drummer's Latest.

The drummer always brings the latest trick. Here it is: Take a spool of white basting-cotton. Drop it into your inside coat-pocket, and, threading a needle with it, pass it up through the shoulder of your coat. Leave the end an inch or so long on the outside of your coat and take off the needle. Four men out of five will try to pick that whole thread off your shoulder and will pull on the spool until it actually does seem as though your clothes are all bastings and that they are unraveling not only your clothes but yourself.

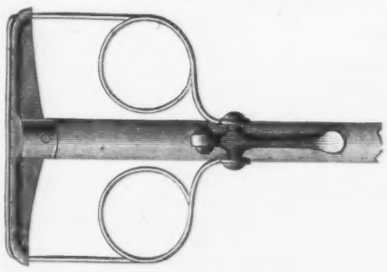
"I was in to see Wilson Barrett in 'Claudian' in Boston last week," said the traveling man. "It was in the most interesting and pathetic portion of the play. Everybody was rapt. I was sitting bolt upright, and didn't know or care to know a soul around me, when suddenly I felt some one tugging at that basting-cotton that I myself had clean forgotten. I didn't say a word and did not move. Foot by foot it unrolled. Half glancing around I saw a man —a total stranger—yanking at that thread. His face was scarlet. He had pulled out about ten yards and was now hauling in hand-over-hand. He didn't dare to stop, because he had decorated my back and the whole aisle with basting-cotton. He hardly dared to go ahead, for he didn't know what portion of my domestic interior economy he was trifling with. Rip! rip! went the thread. Hand-over-hand he yanked it in. The aisle was full of it. 'For Heaven's sake! Will it never end?' said he above his breath. I sat perfectly still and ran the spool while he pulled. How I wanted to yell. I never saw anything in my life half so funny. The whole section of the house got onto it. They didn't know whether to laugh at me or him, and some looked on amazed at the spectacle. At last the stranger behind me gave one frantic rip and yanked out about 11 yards on one bunch, and as the cotton got twisted around his watch-chain, over his eye-glasses, in his very hair and filled his lap, I turned around and producing the spool from my pocket said: 'I am very much obliged for your interest and very sorry that I misled you. You see I have about 124 yards left, but I presume that you don't care for any more to-night. I am honestly sorry, but I can't help smiling.'

"The man was a modest sort of gentleman in appearance. His face was red as fire, even to his ears. He looked at me and then at the spool. He changed color once or twice, and then as the crowd caught on a big laugh went up right in one of the painful passages of 'Claudian,' and the gentleman who had intended to pull that thread off joined in the laugh and said: 'I will square that up on my wife when I get home, but, my friend, I swear to heaven that I did think at one time that I was going to undress you where you sat.'

"It catches every time, and my wife has been fooled twice on it."

The Trojan Mop-Stick.

This improved mop-stick is put on the market by Peabody & Parks, Troy, N. Y. It will be observed that it is operated by a lever, and that the wire is fastened to arms on either side, the wire being lapped around these arms, a construction which is referred to as a decided improvement, avoiding some of the disadvantages which have

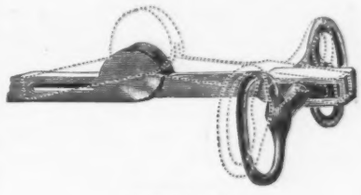


The Trojan Mop-Stick.

characterized mop-sticks where the wire ends are fastened by means of holes in the lever.

Hill's Latch.

The accompanying illustration represents this article, which is made by M. F. Hill, Belleville, Ill. It is intended for use on gates, barn-doors and on shutters affected by expansion, contraction or sagging. By loosening a small nut the latch can be adjusted in or out to meet requirements; is attached usually to the inside of gate or door by means of the handle and one screw; the handle, which serves as an operating-shaft, is passed through a ½-inch hole a suitable distance from the edge of door and should be turned in the hole a few times to make it work easily. The boards on barns, as a rule, are of the proper thickness to suit the length of the round part of handle, while sometimes in gates the picket will require just enough cut out on the side from which the handle is inserted to allow the latch to work without cramping The screw which secures the latch through slot at forward end should be set a suitable distance from end of slot. A small plate is secured to the inner edge of post or casing which fills the space from edge of casing to the slot which receives the latch, and should be placed in such position that when the door is closing the latch will strike it near its upper end.

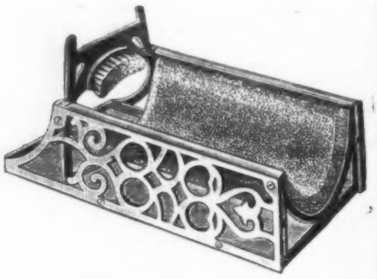


Hill's Latch.

The latch can be operated from either side, and dispenses with the iron hoop and small cord which usually become the substitutes for other latches on gates. The point is made that this latch is especially adapted for barn-doors. Its simplicity and ease of application, the efficiency of its operation and reasonableness of price are points in regard to it which are emphasized by the manfacturer. It is referred to as giving the best of satisfaction where it has been in use.

Combined Foot Wiper and Scraper.

The accompanying illustration represents this article, which is put on the market by Charles E. Spier, sole agent for the United States, 103 Chambers street, New York. It is finished in Tuscan bronze and measures 13 inches long, 8 inches wide and 4¾ inches high. It is intended to remove

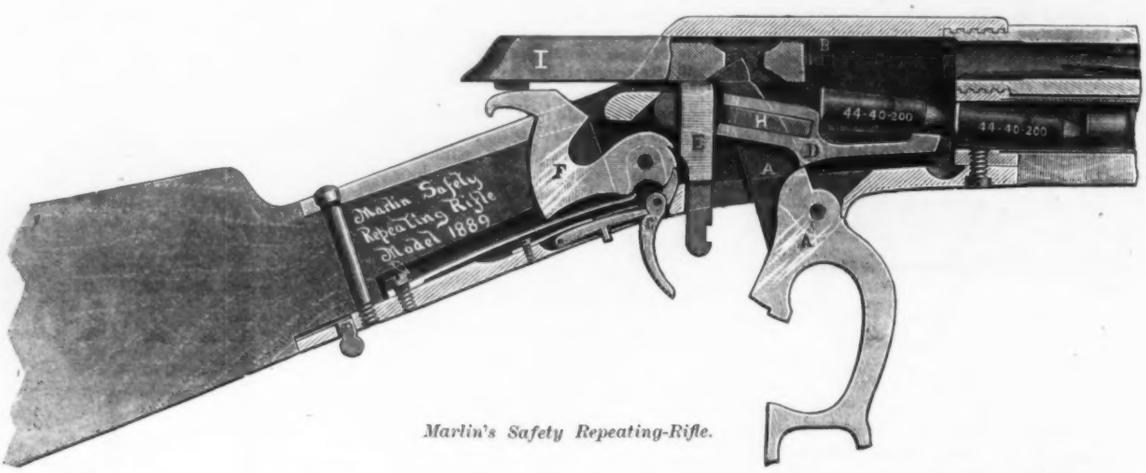


Foot Wiper and Scraper.

mud and dust simultaneously from the soles, sides, toes and uppers of boots or shoes. If desired it can be screwed down to the floor or attached by a chain. The mat, which can be renewed, is, as shown, given a semicircular form. It is specially to be noted that the mat can be replaced at a trifling cost. The small space occupied by the article, its reasonableness in price, durability and the efficiency of its operation are points which are emphasized.

Marlin's Safety Repeating-Rifle.

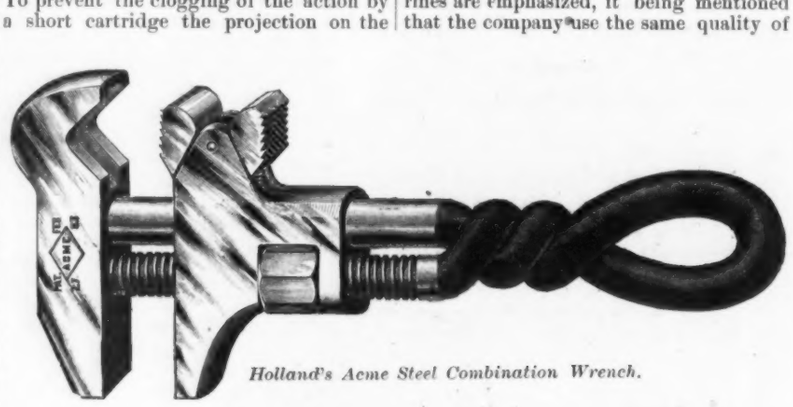
This rifle, the mechanism of which is illustrated in the accompanying illustration, has been recently placed on the market by the Marlin Fire Arms Company, New Haven, Conn., and is sold by Schoverling, Daly & Gales, 302 Broadway, New York, in whose advertisement on page 72 another illustration, showing the method of ejecting the shells, is given. This arm is put on the market especially for sportsmen's use, and its beauty, light weight, strong and simple action, with exceptional shooting qualities, are points made in regard to it. Among the special features of this rifle it is to be noticed that instead of the cartridge being ejected from the top of the receiver it is thrown out from the right side directly over the loading-hole, while the top is entirely solid and unbroken, preventing rain, snow, leaves or dirt from getting into the action. The lock is also provided with a safety-catch, which does not allow the trigger to be pulled back to release the hammer until the lever is up against the receiver and the breech locked. The strength of the breech is especially referred to, and it consists of three parts only—breech-bolt, locking-bolt and finger-lever. The locking-bolt slides in grooves cut in the side of receiver, sets up squarely into the breech-bolt, and a section of the receiver crossing directly behind the locking-bolt supports it solidly. The finger-lever supports both bolts directly. The barrel is chambered to admit the head of the cartridge and also the front end of the breech-bolt, so that the bolt coming solidly against the head of the cartridge covers it completely and is itself supported laterally by the barrel. The carrier is raised and lowered by the action of the finger-lever against an automatic rocker, pivoted near its rear end. To prevent the clogging of the action by a short cartridge the projection on the lower side of the carrier is acted against by the cam on the lever in such a manner that as the lever is thrown down and a cartridge enters the carrier the carrier is slightly raised and closes the magazine, so that no matter how short the first cartridge may be the head of the next one will strike against the front of the carrier and cannot enter until the lever is again closed. To cut off the magazine the lever is thrown down just enough to eject the empty shell, and in this position a cartridge can be loaded directly into the chamber or the chamber left empty by bringing the lever back to the closed position. The carrier is not raised unless the lever is thrown all the way down. Another important point is that, should a cartridge explode with the breech partly open or a shell break around the head, as it often happens, the charge would not back, filling the face with powder, but would pass away to the right over the shoulder without doing harm. We are advised that this has been tested thoroughly with 45 - caliber cartridges in a model gun by firing them repeatedly from the shoulder, with cartridges the heads of which had been almost entirely sawed off, and this without experiencing the slightest inconvenience. There is an automatic lever-catch which prevents the lever from dropping down. It is also to be observed that the gun can be used as a single-loader by dropping the cartridge into the opening in the side and closing the lever. We are advised that this rifle is made 32-20, 38-40 and 44-40 calibers. If a mistake should be made, as, for example, by putting a 44 into a 38 caliber rifle, it is stated that it will work into the carrier all right, but would not enter the chamber nor allow the gun to be closed, so that in this instance all that it would be necessary to do would be to throw down the lever, ejecting the cartridge. The shooting qualities of these rifles are emphasized, it being mentioned that the company use the same quality of barrels as in the finest Ballard target-rifles, which are so widely and favorably known.



Marlin's Safety Repeating-Rifle.

A New Combination Wrench.

Capitol Mfg. Company, Chicago, Ill., are putting on the market Holland's Improved Acme Steel Combination Pipe, Bolt and Nut Wrench, which is represented in the illustration given below. It will be observed that this wrench contains all the well-known features of the Acme Steel Wrench. The Holland improvements consist in the peculiarly-shaped head, which permits a very tight grip on the pipe without slipping or crushing it, but principally in the reversible double-face grip-jaw, which is made of the best quality of tool steel and has two faces with teeth. After the teeth on one side have been worn away the other side can be used, thus making the one grip-jaw equivalent to two. The pin which holds the grip-jaw in place to prevent it from falling out can easily be removed and the jaw reversed in a moment's time. The construction of the lower side is such that the pin holding the grip-jaw receives absolutely none of the strain, the entire strain coming on the shoulders of the grip-jaw carriers, which are shaped in such a manner as to give the



Holland's Acme Steel Combination Wrench.

greatest strength. The teeth on the grip-jaw as they are worn dull can easily be re-sharpened and tempered a number of times, thus giving the tool an exceptional durability. Separate grip-jaws are also furnished at a small cost to take the place of worn ones. The capacity of these wrenches is large and the strength great. They are manufactured in four sizes—5, 10, 12 and 15 inch. The 5-inch combination wrench is especially adapted for a bicycle-spoke wrench and for work on small pipe, wire or gas-burners.

Cooking and Heating Stoves Abroad.

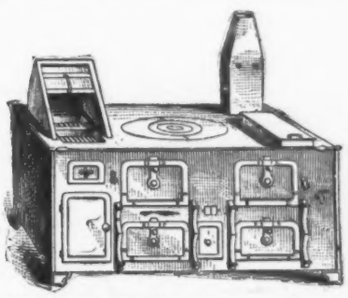
BY WILLIAM J. KEEP.

(*Continued from Page 784, November 14.*)

THE COOKING RANGES OF FRANCE.

In France fuel is dear and the question of economy exerts an influence upon the construction of all cooking and heating apparatus.

In Paris the price of soft coal per ton is $9.65 and cakes made of coal-dust cost the



Cooking and Heating Stoves Abroad.—Fig. 7.—Double-Oven French Range with Reservoir and Broiler.

same. Anthracite brought from Belgium and from Wales costs the same. Wood sawed to a required length also costs $9.65 per ton, all fuel being sold by weight. Outside of Paris these kinds of fuel cost $8.88, the difference being the tax for bringing them into Paris. Gas-coke in Paris costs from $7.53 to $8.88 per ton, and outside $7.53 to $8.50. Charcoal costs in Paris $16.40 per ton and outside $15.44. This is the price when a 50-pound sack is bought at one time. In small quantities it costs double this price.

Anthracite is largely used for heating. Soft coal is used in large ranges, but charcoal is the fuel of France.

Space is not as important a matter as in England, and therefore the ranges of

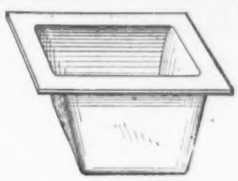


Fig. 8.—Square Fire-Box for Coal.

France are hardly ever set in brick-work or into the chimney. Large ranges often stand in the center of the kitchen and the fumes from the fire pass down a flue at the center and under the floor to the chimney.

THE BETTER CLASS OF FAMILY RANGES

are constructed much like the double-oven ranges of America. They are made very tight, and the fire is never used open. In England all range-doors swing open, while in France nearly all open downward and when open form a shelf to the oven. In England nearly all ranges are made of cast-iron, while in France they are almost universally of wrought-iron. The reason for this is probably that France has practically no iron ore from which to make cast-iron suitable for stoves, and wrought-iron is not only cheap, but so much less weight is necessary that where the iron has to be imported wrought-iron is the cheapest.

On account of the high price of fuel in France the fire-boxes of all cooking ranges are exceedingly small, so small, in fact, that it seems to an American impossible that the ovens could be heated with so small a fire. It is difficult in any case to cause heat from the fire to go downward to reach the bottom of an oven, and to draw the heat under the oven requires that the chimney be quite hot. As this would take fuel the French do the com-

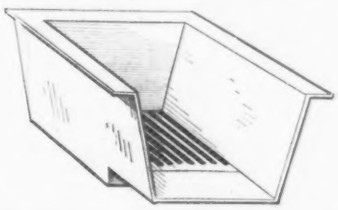


Fig. 9.—Long Fire-Box for Coal or Wood.

mon-sense thing and make their ovens very low, so that the flue by which the heat descends to the oven-bottom shall be very short.

THE FRENCH RANGE

(Fig. 7) seldom has any door in the end of the fire-box and the range-top has but one hole over the fire-box through which fuel is introduced. This hole is large enough to allow of the fire-box being passed in through it and has reducing-rings to bring

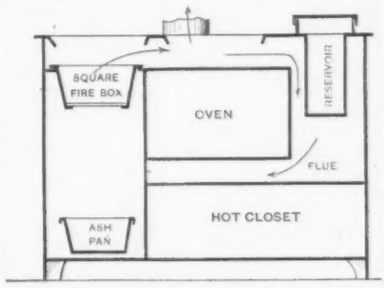


Fig. 10.—Section of French Range with Reservoir in Flue.

the hole down to 6 or 8 inches in diameter. This small opening is filled with a cover with a round hole in the center through which a lifter-hook can be passed to remove it. This small cover is large enough to feed the fire through. The fire is run so moderately that in all household ranges of the smaller varieties the fire-box (Figs. 8 and 9) is simply a square box larger at the top than at the bottom, with a flange projecting outward at the top to rest on the sheet-iron and a flange at the bottom projecting inward on which the grate rests. If this fire-box should burn out it can be replaced by a new one.

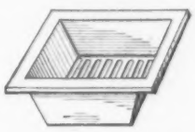


Fig. 11.—Fire-Box for Charcoal.

They have no shaking or dumping grates. In some of the better classes of ranges the flues are so planned as to give the very best results, but it is strange that as a general thing the manufacturer pays but little attention to the construction, and it is the commonest thing to find a copper reservoir hanging in the flue at the side of the oven (Fig. 10) in such a position that the water takes the heat and robs the oven-bottom. In some cases the bottom of the water-reservoir forms the top of the oven. Such a construction would prevent the oven baking well under any circumstances. Such constructions are far more common than the correct proportions. The only reason for such stoves giving satisfaction must be that the French, like the English, expect less of the

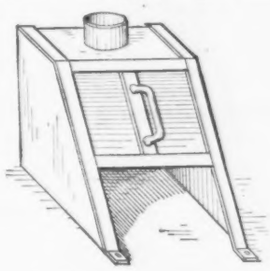


Fig. 12.—Broiler Hood.

ovens than we do in this country. All bread is bought at the baker's, and very often one of the daily meals is taken at a restaurant.

Much more importance is given to boiling and broiling than to baking. In France broiling is scarcely ever done over the fire in the range. Often pieces of ignited charcoal are scattered on the top of the range and the gridiron set over this fire. Most ranges have one or more very

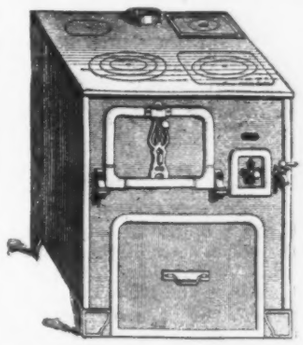


Fig. 13.—Square French Range.

shallow cast-iron pans (Fig. 11), with close-grated bottom, set in the top of the range. Into these are thrown pieces of burning charcoal and the gridiron is set on them. In this case the fumes are drawn downward into the range. Over such a gridiron is generally placed a hood (Fig. 12),

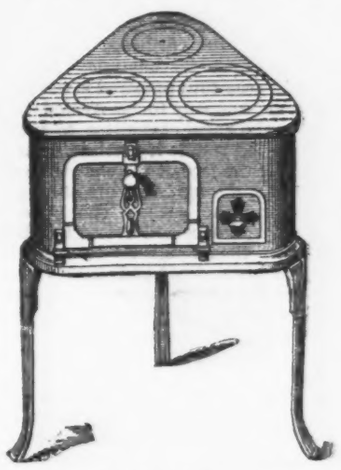


Fig. 14.—Triangular French Range.

to prevent any smell from coming into the room. There are so many varieties of shape in French ranges (Figs. 13 and 14) that no general types can be pointed out. All of the cuts under this head are from ranges that we saw at the Paris Exposition and are now in market, but the ranges

in use seem to be fully as modern as these. Being of wrought-iron and having no ornamentation there is no reason for changing styles, except for the purpose of improving the construction. It is hardly proper to call these little affairs ranges, but as the oven-door is in front and the pipe behind this seems the only name to apply to them.

If we were to describe the appliances that we saw attached to French ranges at the exposition it would take more space than has been allotted to this subject.

(To be continued.)

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., November 18, 1889.

The steel tests which have been carried on for the past two weeks at the Washington Ordnance Yard by the Redeman-Tilford Steel Company, by order of the Secretary of the Navy and under the direction of a committee of naval experts, judging from the amount of inquiry at the Department and from the officers assigned to the duty, are exciting widespread and permanent interest. The tests in every sense have been more than successful. The tests made by the officers of the Naval Board fully sustain the results of those made at the Pittsburgh Testing Laboratory and the Homestead Steel Works, and the opinions of such experts and authorities as Benjamin F. Brown, tester of steel for Carnegie, Phipps & Co.; Dr. L. D. Kastenbine, Thomas Meeker, George W. Ferris, F. G. Frick, Ph.H.H.; D. W. Kaugher, Professor Cook and Ben. Catley.

It is now proposed to supplement these by the official tests of the Government, which will be formulated and made public for information and reference.

The following is a statement of facts from an eye-witness of the treating of steel armor-plates by the Redeman & Tilford Steel Company, made at the Washington Ordnance Yard:

The first plate treated was 30 x 30 x 6, weight about 1600 pounds, 41 carbon Previous to treating the plate the right and left hand corners were slotted out 1 inch in thickness, 6 inches long and 6 inches wide, to be used for getting the tensile and elastic strength of the metal. Three holes were drilled in the side of the plate 2, 3 and 4 inches in depth. The chips from the drillings were sent to the chemist for analysis. After the plate had been thus prepared it was turned over to the company to be treated in the presence of a naval committee to produce the following results if possible. The first 3 inches of the face of the plate to be made very hard and tough steel, gradually growing soft to the back. The plate was placed in a furnace and heated to a bright red color, then immersed in a chemical bath 3 inches in depth and allowed to cool. The plate after treatment was returned to the committee, and by them was placed in a heavy slotting-machine for the purpose of removing the remaining opposite corners and testing the same for tensile strength and elastic limit, elongation, &c. After six hours' work and the breaking of several cutters slotting was abandoned, as it was impossible to slot the last 3 inches of the plate. The slotter passed down, cutting its usual chip through the first 3 inches, when the tool either broke or slipped off, showing that the plate had been treated in every particular as requested. On Saturday last the company treated a 0.63 carbon plate prepared in every particular as the above and to accomplish the same results. This plate was placed under a heavy drill after treatment and drilled from the soft side to a depth of 3 inches, at which point the drill broke, and it was impossible to penetrate further. These plates will now be sent to the Naval Proving-Grounds at Annapolis and be subjected to a shooting-test by solid steel projectiles. The most complete arrangements have been made at the proving-ground to give the plates treated under the eye of the board a severity and scope of tests never exacted from any other make of steel. The results at the Ordnance Yard are considered as fully justifying such a course, and it is expected that the publication of the tests for treatment and trials for defensive naval purposes will astound the world.

After the first tests developed that something of more than ordinary concern to the art of steel-making was going on the experiments became the center of interest both in naval circles here and at the industrial centers. Irving M. Scott, of the Union Iron Works, San Francisco, Cal., was one of the most interested spectators. After witnessing one or two of the experiments to sufficiently convince himself of the results of the Redeman-Tilford treatment Mr. Scott at once entered into negotiations with the parties for the control of the process in his section. The owners of the process and Mr. Scott have come to terms which give the latter, representing the Union Iron Works, of San Francisco, the exclusive right to use the Redeman-Tilford treatment for the entire Pacific Coast. Other steel companies are already in correspondence with the company to secure rights. It is proposed to grant licenses for the use of the process by the payment of reasonable royalties.

In connection with the scientific tests being made at the Ordnance Yard a number of scientific and practical gentlemen were much interested in the examination of a number of samples of steel of the Redeman-Tilford process at the Washington office of Col. Charles W. Hayes, the business manager of the company. One of the samples was a piece of an old Bessemer rail that had been heated to a red heat, submerged in the chemical bath of the Redeman-Tilford process and again reheated and hammered out into a 1-inch bar. From a piece of this treated rail several razors were made.

Another sample was a rail treated by this process, the top part of which was hard, tough, fine steel and the base soft steel.

Still another sample was that of a portion of the spoke of a large fly-wheel, 2¾ inches in diameter, that had been treated by the process to make the outside ¼-inch hard, tough steel and leave the center soft.

One of the most interesting exhibits were samples of laminated plates, 3, 5, 10, 15, 20, 25 ply, illustrating that steel treated by this process can be welded to soft iron. It was explained that after the steel was treated the steel and soft-iron plates were laid together, one on top of the other, and reheated in the furnace, without flux of any kind, and were then rolled to welding; also that the plate could be beaten in any shape and machined if desired. But by reheating and submerging in the Redeman and Tilford chemical baths it is claimed that it became drill-proof.

In this interesting collection there were some 50 other samples, one of which was a solid block of steel 14 x 14 x 7 inches. This block had been treated to see if 3½ inches could be made drill-proof and have the other 3½ inches soft steel, gradually growing softer toward the back. This piece had been drilled 3½ inches in depth on a 30,000-pound drill-machine in the following time, viz.: Drilling from the soft side, the first inch, 1 minute 23 seconds; second inch, 9 minutes 18 seconds; third inch, 16 minutes 12 seconds; next half inch, 21 minutes, when the drill broke and it could not be drilled further.

It is reported that the Governor of Mexico has granted a concession for a railroad from the United States frontier to the boundary of Guatemala, with lateral branches. The subsidy named is $8000 per kilometer.

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CURRENT HARDWARE PRICES.

NOVEMBER 20, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands.....20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40&10@40&10&10%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10..2.30
U. M. C. & W. R. A.—B. E., 7&8...2.60
U. M. C. & W. R. A.—P. E., 11 up..3.10
U. M. C. & W. R. A.—P. E., 9&10..4.00
U. M. C. & W. R. A.—P. E., 7&8...4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ℔ 10¢.....20@20&5%
Peter Wright's.....10¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11¼@11½¢
Trenton.....9¼@9½¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Daisy.....℔ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6 00
Turntable.....℔ doz 4.50
Victor.....℔doz 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. } 70%
French, Swift & Co. (F. H. Beecher, Rockford Bit Company)
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32¼ quarters, No. 5, $6; No. 30, $3.50..30%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits...25%
Imitation Jennings' Bits.....60@60&5%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10@60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auge Bits.....10%
Cincinnati Bell-Hangers' Bits.....30%

Hollow Augers—

Ives' } 33⅓@
French, Swift & Co. } 33⅓&10%
Douglass' }
Bonney's Adjustable, ℔ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....30@30&5%
Cincinnati Standard.....25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal.....40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ℔ doz.....40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top. ℔ gr $10.00...45&10%
Pat. Peg, Leather Top.℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg. ℔ gr $2.45, 40@40&10%
Awls. Pat. Peg...℔ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr.....35%
Awls, Handled Brad...$7.50 ℔ gr.....45%
Awls, Handled Scratch ℔ gr, $7.50.85&10%
Awls, Socket Scratch. ℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality.....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes.....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting...10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—

No. 1.4¢@4½¢, No. 2 5¼¢@5½¢ } 3 % cash
Nos. 7 to 14.....55&5% }
Nos. 15 to 18.....47½% }
Nos. 19 to 22.....70% }
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengie's Pat.....℔ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, @10; No. 2, @9.25&10&5%
McGill's.....℔ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ℔ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger.....℔ ℔ 7½@8¢
Barbed, ⅝ in.....℔ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush, Com'n " ...55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....70&10&10&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, according to size...75&10@80%
Bolt Ends, according to size..75&10@80%

Tire—

Common, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....70%
Phila., list Oct. '84.....82½%
Keystone, Philadel., list Oct. '84...80%
Norway, Phila., list Oct. '84 ...75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....82½%
Bay State, list Feb. 28, '83.....70%
R.B.&W., Philadel., list Oct. 16, '84...82½%

Stove and Plow—

Stove.....65%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10	
Jennings	5.50	6.75	45@45&10	
Other Machines	2.35	2.75		net
Phillips' Patent with Augers	00	7.50		

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co...50&10@50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 ;10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....85%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list.....50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's'.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} ..70&10 @75%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&10 @75%

Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....℔ ℔ 5½@6¢
Dewicks (Burke).....℔ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15&20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45&50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.50
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50.....50&10&10%
World's Best, ℔ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....35&5%
Domestic, ℔ doz $2.50.....45%
Champion ℔ doz $2.00.....50 %

Cards—

Horse & Curry.....10&10@10&10&10%
Cotton.....10&10&10%
Wool.....10@10&10%

Carpet Stretchers—

Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—

Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $45.00
Grand Republic.....₱ doz $55.00

Cartridges—

See Ammunition.

Casters—

Bed, Plate, Shallow Socket.....Brass....55@55&10%; Others...60@60&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—

Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—

Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$3.00	5.70	4.80	4.20	3.90	3.75	3.65	3.55

Less than cask lots, add ½¢@⅝¢ ₱ lb.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ lb 5@5½¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—

White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—

See Lines.

Chisels—

Socket Framing and Firmer.

P. S. & W., New Haven, Mix, Ohio Tool Co.....75 @ 75&10 %
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%

Tanged and Miscellaneous.

Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ lb.....16@19¢

Chucks—

Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....65%&5@70%
Norway Spring Bar Clips, 5-16...60&5&5%
Wrought-Iron Felloe Clips.....₱ lb, 5½¢
Steel Felloe Clips.....₱ lb, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—

Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses, Dividers, &c—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—

Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Cork Knives and Cutters—

Bradley's.....10%
Wadsworth's.....25%

Cradles—

Grain.....50&5&2 @ 50&10&2%

Crayons.

White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—

Cast Steel.....₱ lb 4½¢
Iron, Steel Points.....₱ lb 3½¢

Curry Combs—

Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—

Silvered Glass.....net
White Enamel.....net

Cutlery—

Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—

See Compasses.

Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—

Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. ₱ $15.00.....50%
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—

Witherby, P. S. & W., Mix, New Haven.....75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools....$1.75@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits

Drill Chucks.—See Chucks.

Dripping Pans—

Small sizes.....₱ lb 6½¢
Large sizes.....₱ lb 5½¢

Egg Beaters.

Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)...₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—

Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—

Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ lb	4½¢	5 ¢	2½¢
½ kegs, ₱ lb	4¾¢	5¼¢	2¾¢
¼ kegs, ₱ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots.....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....50%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ lb 6@6½¢

Fifth Wheels.—

Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60@10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands....60&10@70%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported—

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20&25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, No. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter.₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors.....45%

Fodder Squeezers—

Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—

Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—

Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—

Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—

Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10 @ 75%
Acme Fry Pans.....60&10%

Fuse— ₱ 1000 ft

Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—

Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—

Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—

See Saws.

Halters—

Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85..
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
.....List Jan. 15, '87 50@50&10%
Fayette R. Plumb.....40&10@50%
C. Hammond & Son..List, Oct., 1889, 50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 ℔ and under.....₱ ℔ 40¢
3 to 5 ℔.....₱ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢₱ ℔

Handcuffs and Leg Irons—

R. I. Tool Co., Handcuffs, $15.00₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%

Handles—

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	.50

60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Door Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%

Handles, Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd.₱ gr 4.50
Hickory Firmer Chisel, large.₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd..₱ gr 5.00
Socket Framing Chisel, ass'd.₱ gr 5.00
} 40@50%
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢
Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track..... ... ... 55%
ed's Steel Arm.....50%
allenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15@60%
Wood Track Iron Clad, ₱ ft. 10¢.....50
&15@60%
Carrier Steel Anti-Friction.....50@50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Feltz, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10&25&10%
Warner's Pat.....20@20&10%
Stearns' Anti-Friction.....20@20&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Harness Snaps—
See Snaps.
Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10@50%
Hurd's.....40&10@50%
Fayette R. Plumb.....40&10@50%
Wm. Mann, Jr., & Co.....50@50&5%
Underhill Edge Tool Co.....40&5@40&10%
Underhill's, Haines and Bright.....33⅓&5
C. Hammond & Son.....40&10@50%
Simmons'.....40&10@50%
Peck's.....40&10@40&10&5%
Kelly's.....50@50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%
Hay and Straw Knives—
Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.50@$12.00
Heath's.....₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $10.00
Hinges—
Wrought Iron Hinges
Strap and T.....70&10@75%
Screw Hook and Strap.....{ 6 to 12 in., ₱ lb. 2-10¢ / 14 to 20 in., ₱ lb. 3 7-10¢ / 22 to 36 in., ₱ lb. 3 2-10¢
Heavy Welded Hook.....{ 6 to 12 in., ₱ lb. 2-10¢ / 14 to 20 in., ₱ lb. 3 7-10¢ / 22 to 36 in., ₱ lb. 3 2-10¢
Screw Hook and Eye.....{ ½ in., ₱ doz $1.50 / ⅝ in., ₱ doz $2.45 / ¾ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₱ lb.....5¢ / over 12 in., ₱ lb. ...4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star..20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15&20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Butler.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
O. S., Lull & Porter.....75&10@80%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50.....25&2%
Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat..60&5@60&10%
Hubbard & Co., S. & O. Pat.60&5&60&10%
Chattanooga Tool Co., S. & O. Pat..60&5&60&10%
Grub.....60@60&10%
Hog Rings and Ringers—
Hill's Improved Ringers.....₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30
Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%
Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%
Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....60@60&5%
Unground.....60&10@60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40%
Gray Enameled-Ware—
Stove.....45@50%
Maslin Kettles.....60&10@60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co..... } 40&5%
Hooks—
Cast Iron—
Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.. } 60&10&10%
60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt.....80@80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55&10%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable iron. 70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.
Horse Nails—

	Nos. 6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.....10%@ 11¢, net
Essex .....28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra.....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Snowden ....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢.
1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&25%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢.
25@25&5%
Globe.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢.
25&10&10%
New Haven..28 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion...25¢ 23¢ 22¢ 21¢ 20¢.
10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢.
35&5@35&10%
Star.....23¢ 21¢ 19¢ 18¢.
10&10&10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ lb.
Horse Shoes—See Shoes Horse.
Hose, Rubber—
Competition.....75&10@75&10&5%
Standard.....70@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%
Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper.....₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50
Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3 00
See also *Pails.*
Lock Screws—See Screws.
Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₱ lb.... 24¢ 21 ¢
Brass larger than 17 in., ₱ lb..... 26¢ 23½¢
Enameled and Tea Kettles. See *Hollow-Ware.*
Keys—
Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%
Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%
Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives..₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50
Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....50&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Ladles.—
Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Mource's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%
Lanterns—
Tubular—
Plain with Guards, ₱ doz....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%
Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%
Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....45%
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 12 16 20
$4 0 ..$3 50 $3 00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%
Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar.20, 1889..... } 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88..... } Much lower net prices often made.
Sargent & Co., list Aug. 1, '88 Reading Hardware Co., list Feb. 2, '88.....
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Felter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan.1,'85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓&5
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 01.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall, Iron Socket Peavies.....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00
Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00
Mallets—
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%
Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.5
Mattocks. Regular list.....60@60&10%
Meat Cutters—
Dixon's ₱ doz.....40&5%

Nos.....	1	2	3
	$14.00	$17.00	...00

Woodruff's ₱ doz.....40&5%

Nos...	100	150	200
	$15.00	$18.00	

Champion ₱ doz.....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz.....70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz.....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..	5	2	6	8
	$50	$75	$80	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $60.00
Mincing Knives—
Am. (2d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00, 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Molasses Gates—
Stebbin's Pattern.....75@75&10%
Stebbin's Genuine.....60@10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10
Weed's.....20&10%
Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10.....60@10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—
Safety.....₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889....70&5%
Tack Mfrs.' list.....60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base....$3.00 @ $3.10

Nail Puller—
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Nail Sets—
Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—
Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.1¢ 5.8¢
Cold Punched..... 5.1¢ 5.4¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government.....₱ ℔ 7½@7¾¢
U. S. Navy.....₱ ℔ 6¾@6¾¢
Navy.....₱ ℔ 5½¢@5¾¢

Oilers—
Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.00; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2

Packing, Steam—
Rubber—
Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 30%
Jenkins' Standard.....₱ ℔ 80¢, 35%
Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13¢@14¢ ₱ ℔
Cotton Packing.....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—See Trade Report
Quarts..... 10 12 14
Hill's Light Weight, ₱ doz. $2.75 3.00 3.25
Hill's Heavy Weight, ₱ dz. 3.00 3.25 3.75
Whiting's..... 2.75 3.00 3.25
Sidney Shephard & Co.... 2.94 3.15 3.37
Iron Clad..... 2.50 2.75 3.00
Fire Buckets..... 2.75 3.25 3.50
Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt.....₱ doz $6.00
Fire, Stable and Milk, 14 qt..₱ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60 @ 60&10%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....50%
1¼ and under, Galvanized.....42½%
1½ and over, Plain.....62½%
1½ and over, Galvanized.....50%
Boiler Tubes, Iron.
1½ and under.....50%
2 in. and larger.....55%

Planes and Plane Irons—
Wood Planes—
Molding.....50&10&2%
Bench, First Quality.....55&10&2%
Bench, Second Quality.....60&10&2%
Bailey's (Stanley R. & L. Co.).....40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes.....35@35&5%
Merrien Mal. Iron Co.'s.30&10@30&10&10%
Davis's Iron Planes...30&10@30&10&10%
Birmingham Plane Co.....50@50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes.....40@40&5%
Sargent's.....30&10@30&10&10%
Plane Irons—
Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....40%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—
Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz.....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.
Prestoline.....20&10%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.50
Bishop's O. K.....₱ doz $5.50
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $3.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.5@11.00
Round or Square, 2 qt...₱ gr $18.50@20.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18.00
Ryan's Post Hole Diggers...₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15.....45%

Potato Parers—
White Mountain.....₱ doz $5.00@5.50
Autrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55&60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40%

Pumps—
Cistern. Best Makers.....60@60&10%
Pitcher Spout, Best Makers....67½@70%
Pitcher Spout, Cheaper Goods..70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.00
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'.....₱ doz $1.44, 55%
Tinners' Hollow Punches.....20@2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door. Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron .₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ¾ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet...$2.15 2.70 3.25...net
Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods.....70%
Cast Steel, outside goods.....60&10@70%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%

Razor Strops—
Genuine Emerson.....60@60&5%
Imitation "....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%

Rivets and Burrs—
Iron, list Nov. 17, '87.....45%
Copper.....50&10@60%

Rivet Sets.....50&10%

Rods—
Stair, Brass.....25&2%
Stair, Black Walnut.....₱ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—
Manufacturers' prices for large lots:
Manilla...½ in. and larger ₱ ℔ 13¼¢
Manilla.....⅜ in. ₱ ℔ 13¾¢
Manilla.....¼ and 5-16 in. ₱ ℔ 14 ¢
Manilla Tarred Rope.....₱ ℔ 12¾¢
Manilla. Hay Rope.....₱ ℔ 13¾¢
Sisal...½ inch and larger ₱ ℔ 11 ¢
Sisal.....⅜ in. ₱ ℔ 11¼¢
Sisal.....¼ and 5-16 in. ₱ ℔ 11¾¢
Sisal, Hay Rope.....₱ ℔ 11 ¢
Sisal, Tarred Rope.....₱ ℔ 10¼¢
Sisal, Medium Lathe Yarn.₱ ℔ 10 ¢
Cotton Rope.....₱ ℔ 15@18¢ net
Jute Rope.....₱ ℔ 7½¢
1½% for cash in 10 days.

Rules—
Boxwood.....80&10&10@80&10&10&5%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—
From 4 to 10, at factory ...₱ 100 ℔, $2.60@$2.75
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'...₱ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40%
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30 %

Sand and Emery Paper and Cloth—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—
Common.....₱ ℔, 10@11¢
Patent, good quality.....₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 25@23¢
Common Russia Sash.....₱ ℔ 13½¢
Patent " " .....₱ ℔ 15¢
Cable Laid Italian Sash.....₱ ℔ 22¢@23¢
India Cable Laid " .....₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&1⅓%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60@60&10%
Lieschе's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888. 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Sash Weights—
Solid Eyes.....₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry....₱ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Saws—
Disston's Circular.....45@45&5% } Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5% } Extras sometimes given by jobbers.
Disston's Hand 25@25&5% } Extras sometimes given by jobbers.
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back, ₱ foot 27¢@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Diamond Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—
White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished....₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, $9, No. 15, $5.50; 20& 10@20&10@30%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion.....₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—
Atkins' Perfection.....₱ doz $15.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00, 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons....33⅓@
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s Varnished Handles.....65&10% Black Handles.....60&10%
Sargent & Co.'s No. 1 Forged Blade.....60&10&10% Nos. 20, 30 and 60.....66⅔&10&10%
Knapp & Cowles' No. 1.....60&20@70% No. 1 Extra.....60@60&10% Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....50@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits.....₱ doz 50@75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw-Drivers.....25&10%

Screws—
Wood Screws—List March 1, 1889
Flat Head Iron.....50% } Extra 5 @ 10 % often given
Round Head Iron.....40% } Extra 5 @ 10 % often given
Flat Head Brass.....45% } Extra 5 @ 10 % often given
Round Head Brass.....35% } Extra 5 @ 10 % often given
Flat Head Bronze.....45% } Extra 5 @ 10 % often given
Round Head Bronze.35% } Extra 5 @ 10 % often given

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, orse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory, $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(*Eastern prices 2¢ off, cash, 5 days.*
Drop, ₱ bag, 25 ℔.....$1.21
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.46
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15&25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889.....45&10%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.....₱ doz $2.00; ₱ gr $21.60
Electric.....₱ gr $18.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—
School, by case.....50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Audrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list. ..70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50
Boardman's Britannia Spoons, case lots.....60
} 5 mos.

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....
Nickel-Plated.....
} 75&10@80%, fullcs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized, } Same price
Fence Staples, Plain..... } as B'rb Wire

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30%
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand.....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,*10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 25.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro 8 cans
Yates' Liquid, 2 3 5 10 gal....8¢
₱ gal ..$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List Oct. 19, 1889:
American Carpet, Blued.....75&10&2%
American Carpet, Tinned and Coppered.....77½&10&2%
Steel Carpet, Bright & Blued..72½&10&2%
Steel Carpet, Tinned and Coppered.....75&10&2%
Swedes Iron Carpet, Blued.....75&10&2%
Swedes Iron Carpet, Tinned..77½&10&2%
American Iron.....72½&10&2%
Swedes Iron, S. S., Blued.....75&10&2%
Swedes Iron, S. S., Tinned....77½&10&2%
Swedes Iron, Lanc, Blued....67½&10&2%
Swedes Iron, Lanc., Tinned....75&10&2%
Gimp and Lace, S. S., Blued....75&10&2%
Gimp and Lace, S. S., Tinned.77½&10&2%
Gimp and Lace, Lanc., Blued.67½&10&2%
Gimp and Lace, Lanc, Tin'd..75&10&2%
Basket and Trimmers', Lanc....65&10&2%
Hungarian Nails.....70&10&2%
Miners', S. S.....75&10&2%
Miners', Lanc.....70&10&2%
Common and Patent Brads....70&10&2%
Leathered.....45&10&2%
Brush.....60&10&2%
Looking-Glass.....50&10&2%
Picture-Frame Points.....50&10&2%
Copper.....55&10&2%
Carpet, Blued by the count...75&10&2%
Carpet, Tin'd, by the count....½&10&2%
Swedes Iron, Lanc. Blued..67½&10&2%
Swedes Iron, Lanc., Tinned...75&10&2%
Swedes Iron, S. S., Blued.....75&10&2%
Swedes Iron, S. S., Tinned...77½&10&2%
Gimp & Lace Lanc., Blued.67½&10&2%
Gimp and Lace, Lanc., Tin'd..75&10&2%
Gimp and Lace, S. S., Blued...75&10&2%
Gimp & Lace, S. S., Tinned..77½&10&2%
Trimmers', Lanc.....65&10&2%
Basket, Lanc.....65&10&2%
Finishing Nails.....67½&10&2%
Trunk and Clout Nails, Black..70&10&2%
Trunk and Clout Nails, Tinned or Copper ed.....70&10&2%
Hungarian Nails.....70&10&2%
Basket Nails.....65&10&2%
Chair Nails.....65&10&2%
Cigar Box Nails.....55&10&2%
Copper Trunk & Finish. Nails.45&10&2%
Zinc Glaziers' Points.....45&10&2%
Double-Pointed.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....33⅓&35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pl'ed, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Relher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70@70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz, 90¢; in full cases, ₱ doz....75¢
Hotchkiss Imp. Rat Killer...₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ½ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ½ ℔ Balls.....	16¢	27¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.48@50¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ Balls.....12¢@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....61½¢@63½¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25&30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40&40&10%
Trenton.....40&5&40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2¾¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's, ₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	⅛	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
See Trade Report.
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—See Trade Report.
Market,
Br. & Ann., Nos. 0 to 18.....67½%
Cop'd, Nos. 0 to 18.....62½%
Galv., Nos. 0 to 18.....57½%
Tin'd, Tinned list Nos. 0 to 18.....57½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....70%
Bright and Ann'd, Nos. 19 to 26..70&5%
Br. and Ann'd, Nos. 27 to 36.....75%
Tinned.....70%
Tinned Broom Wire.....70&70&5%
Galvanized Fence.....60%
Annealed Fence, Nos. 8 and 9.....67½%
Annealed Grape, Nos. 10 to 14.....67½%
Brass, list Jan. 18, 1884.....25@30%
Copper, list Jan. 18, 1884.....30 @ 35%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin'sSteel and Tin'd Wire on Spools, 60%
Malin's Brass and Cop. Wire on Spools45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting....72½@75%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co. 70&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
Goes' Pattern, Wrought.....
Girard Agricultnral.....
Lamson & Sessions' Agric'l..
Sterling Wrought.....
} 75&10@75 &10&5%
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....55%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches...15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 80&20@80&25&

CURRENT METAL PRICES.

NOVEMBER 20, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
¾ to 2 in. round and square.. } ₩ lb 2 00 @ ....¢
1 to 6 in. x ⅝ to 1 in..... }
Refined Iron:
¾ to 2 in. round and square.. }
1 to 4 in. x ⅝ to 1½ in..... } ₩ lb 2.20 @ ....¢
4¼ to 6 in. x ⅝ to 1 in..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.40 @ ....¢
Rods—⅝ and 11-16 round and sq.. ₩ lb 2.30 @ ....¢
Bands—1 to 6 x 3-16 to No. 12..... ₩ lb 2 50 @ ....¢
"Burden Best" Iron, base price.. ₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2 80 @ ....¢
"Ulster"..... ₩ lb 3.00 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¼¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 3.00	@ 3.00¢	3.50	@ ....¢
17 to 20	₩ lb 3.25	@ 3.25¢	3.50	@ 3.75 ¢
21 to 24	₩ lb 3.35	@ 3.35¢	3.75	@ ....¢
25 and 26	₩ lb 3 45	@	3.75	@ ....¢
27	₩ lb 3.55	@ 3.62½¢	4.00	@ ....¢
28	₩ lb 3.75	@ ....¢	4.25	@ ....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb, 4.87½	@ ...	4.75½	@ ....¢
Galv'd, 21 to 24,	₩ lb, 5.25	@ ...	5.12½	@ ....¢
Galv'd, 25 to 26,	₩ lb, 5.57½	@ ...	5.50	@ ....¢
Galv'd, 27	₩ lb, 6.00	@ ...	5.85½	@ ....¢
Galv'd, 28	₩ lb, 6.37½	@ ...	6.23	@ ....¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B	₩ lb 5¢ @ 7¢			
Craig Polished Sheet Steel	₩ lb, 8½¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	23¼¢
English, Pigs	23½¢
Straits in Bars	23¾¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade	IC, 10 x 14	@ $6 50
" "	IC, 12 x 12	@ 6 75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@ 13.00
" "	IX, 10 x 14	@ 8.00
" "	IX, 12 x 12	@ 8.25
" "	IX, 14 x 20	@ 8.0
" "	IX, 20 x 28	@ 15 75
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 7.50
Calland Grade	IC, 10 x 14	@ 6.50
" "	IC, 12 x 12	@ 6 75
" "	IC, 14 x 20	@ 6.40
" "	IX, 10 x 14	@ 7.65
" "	IX, 12 x 12	@ 7.90
" "	IX 14 x 20	@ 7.65
Allaway Grade	IC, 10 x 14 5.50	@ 5.6
" "	IC, 12 x 12	@ 5.75
" "	IC, 14 x 20	@ 5.60
" "	IC, 20 x 28	@ 11.00
" "	IX, 10 x 14	@ 6.75
" "	IX, 12 x 12	@ 6.90
" "	IX, 14 x 20	@ 6.75
" "	IX, 20 x 28 13.25	@ ....
" "	DC, 12½ x 17	@ 5.80
" "	DX, 12½ x 17 6 00	@ 6.80

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20	$4.90	@ $5.12½
10 x 20		@ 7.25
20 x 28		@ 10.25
IX, 10 x 14, 14 x 20		@ 6.0
BV Grade.—IC, 10 x 14, 14 x 20		@ 4.87½

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20		@ $5.10
20 x 28		@ 10.25
IX, 14 x 20		@ 5.90
20 x 28		@ 11.80
Abecarne Grade.—IC, 14 x 20	4.50	@ 4.87½
20 x 28	9.50	@ 9.87½
IX, 14 x 20		@ 5.8
20 x 28		@ 11 60

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	$13 00 @ $13.00
IXX, 14 x 28	112 sheets	@ 13 25
IXX, 14 x 31	112 sheets	@ 14.75

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 13¾¢
Baltimore Grade	@ 12¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		20	20	20	21	22	23	26	28
30		72	20	20	20	21	23	25	29	....
36	96		20	20	20	22	24	28	30	....
36		96	20	20	21	23	25	29	31	....
48	96		20	20	22	24	26	30	....	....
48		96	20	20	23	25	27	31	....	....
60	96		20	20	25	27	32	....	....	....
60		96	20	21	26	....	....	....	....	....
84	96		21	22	....	....	....	....	....	....
84		96	22	23	....	....	....	....	....	....
Over 84 in. wide			23	25	....	....	....	....	....	....

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets				
Per pound	20.23	0.25	0.27	0 30

Bolt Copper, ⅝ inch diameter and over, per pound..... 20¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	23¢
12 ounce and up to 14 ounce to square foot	24¢
10 ounce and up to 12 ounce	26¢

Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.
14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb
24 x 48 and 30 x 60.
14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	30	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	38	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper, Bronze and Gilding Tube, 2¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ 30 %

Roll and Sheet Brass.

Discount from list..... 25 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢

Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¢
"Bergenport"	8¼¢
"Bertha"	8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	6½¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4¼¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¼¢

Solder.

½ @ ½ (Guaranteed) 14½¢
Extra Wiping 12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 27 ¢
Hallett's	" 21 ¢

Fittings.

Cast Iron Fittings, Black and Galvanized	75 %
Cast Iron Fittings, Bushings & Plugs	75&10@75&10&5 %
Cast Iron Fittings, Flanges	75 %
Malleable Iron Bushings	75&10@75&10&5 %
Malleable Iron Unions	70 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&5@75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	65 %
Radiator Nipples	6 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	50 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	62
" " boiled		63 @	65
" Western, raw		57 @	58
Lard, City, Extra Winter		56 @	..
" " Prime, present make		54 @	55
" " Extra No. 1		45 @	48
" " No. 1		38 @	42
" Western, prime		54 @	55
Cotton-seed, Crude, prime		28 @	29
" " off grades		26 @	27
" Summer Yellow, prime		@	36
" " " off grades		34 @	35
Sperm, Crude		@	65
" Natural Spring		67 @	68
" Bleached Spring		72 @	73
" Natural Winter		74 @	75
" Bleached Winter		79 @	80
Whale, Crude		@	45
" Natural Winter		46 @	..
" Bleached Winter		47 @	..
" Extra Bleached		51 @	..
Sea Elephant, Bleached Winter		58 @	60
Menhaden, Crude, Sound		22 @	24
" Crude, Southern		.. @	..
" Light Pressed		28 @	29
" Bleached Winter		34 @	..
" Extra Bleached		38 @	39